



Missouri Department of Natural Resources

Division of Environmental Quality



Forms and Permits Publications News and Public Notices State Parks
Calendar

site state

Air Pollution Control
Program

Air Quality Data System

Air Program Advisory
Forum

Commissions and Boards

Gateway Vehicle
Inspection Program

Inspection and
Maintenance (I/M)

Permits

Publications and Reports

Report an Environmental
Problem

Laws and Regulations

State Plans



2000 Annual Report

The Air Pollution Control Program produces an annual report to provide Missouri residents information about the status of air quality in the state. The publication is made available here in electronic format. The publication is divided into chapters for quicker download.

- [Cover Page](#) (05/00) 108 KB
- [Regional and Satellite Offices](#)
- [Introduction and Table of Contents](#) (05/00) 18 KB
- [Chapter 1: 2000 Air Quality Highlights](#) (05/00) 108 KB
- [Chapter 2: Gateway Clean Air Program](#) (05/00) 64 KB
- [Chapter 3: Major Air Pollutants](#) (05/00) 15 KB >
- [Chapter 4: Clean Air Standards](#) (05/00) 43 KB
- [Chapter 5: Air Quality Monitoring Sites in Missouri](#) (05/00) 108 KB
- [Chapter 6: Missouri's Air Quality](#) (05/00) 101 KB
- [Chapter 7: Ozone in Missouri](#) (05/00) 24 KB
 - [Ozone in St. Louis](#) (05/00) 308 KB
 - [Ozone in Kansas City](#) (05/00) 15 KB
- [Chapter 8: Lead in Missouri](#) (05/00) 333 KB
- [Chapter 9: Keeping Country Air Clean](#) (05/00) 160 KB
- [Chapter 10: About The Air Pollution Control Program](#) (05/00) 25 KB
- [Chapter 11: Missouri Air Conservation Commission](#) (05/00) 99 KB
- [Chapter 12: 2000 Rules Update](#) (05/00) 30 KB
- [Air Quality Information](#) (05/00) 12 KB
- [Glossary](#) (05/00) 13 KB

[Land](#) | [Air](#) | [Water](#) | [GIS](#) | [Energy](#) | [State Parks](#) | [Grants and Loans](#) | [Security and Privacy](#) | [State Home Page](#) | [Site Directory](#) |
[Kids and Education](#) | [Waste and Recycling](#) | [Historic Preservation](#) | [Job Opportunities](#) | [DNR Store](#) | [Search](#) |



Missouri
Department of
Natural Resources

P.O. Box 176, Jefferson City, MO 65102
 800-361-4827 / 573-751-4817
 E-mail: cleanair@dnr.mo.gov
 Revised on Monday July 05 2010

Air Pollution Control Program Report 2000



Missouri Department of Natural Resources
Division of Environmental Quality

Table of Contents

1999 AIR QUALITY HIGHLIGHTS	2
--------------------------------------	---

MISSOURI AIR: A QUARTER CENTURY IN RETROSPECT	6
---	---

MAJOR AIR POLLUTANTS	8
-------------------------------	---

HEALTH EFFECTS OF AIR POLLUTION	9
--	---

CLEAN AIR STANDARDS	10
------------------------------	----

AIR QUALITY MONITORING SITES IN MISSOURI	12
--	----

MISSOURI'S AIR QUALITY	14
---------------------------------	----

OZONE IN MISSOURI.....	16
Ozone in St. Louis	
Controlling St. Louis Ozone	
Ozone in Kansas City	
Controlling Kansas City Ozone	

LEAD IN MISSOURI.....	22
-----------------------	----

PM _{2.5} IN MISSOURI.....	24
------------------------------------	----

ABOUT THE AIR POLLUTION CONTROL PROGRAM	25
---	----

MISSOURI AIR CONSERVATION COMMISSION	27
--	----

AIR QUALITY INFORMATION	30
----------------------------------	----

AIR POLLUTION ON THE INTERNET	31
--	----

GLOSSARY	32
----------------	----

Introduction

He steps up to the plate, his jaw set firmly. Tens of thousands watch quietly as he lifts the heavy bat, waiting for that powerful swing. He takes a deep breath before launching the tiny sphere into orbit. CRACK!

Missouri's air sustains us in everything we do. Whether working in a garden, waiting for a bus or hitting homeruns, clean air provides us life energy. The Missouri Department of Natural Resources' (DNR) Air Pollution Control Program (APCP) continues to look for new ways to improve the quality of air for Missouri's residents.

As Missouri begins a new millennium, APCP will once again rely upon the support of citizens, businesses, industry and federal, state and local governments to keep the air clean for all Missouri's residents. APCP hopes that you will continue monitoring rules and legislation regarding air pollution, and contact us when you have questions and concerns. It is also important that citizens inform DNR of unusual odors, emissions or smoke. To provide clean air across the state, it will take an active involvement by all Missouri citizens. Through regular tune-ups, use of low-solvent products, composting of yard waste and proper disposal of waste that cannot be composted, each person's contribution is multiplied. Equally important, we must learn to use energy more efficiently. Energy consumption is directly related to most air quality problems. The more gasoline and electricity we use, the greater the burden we place on our air.



Missouri's air quality has experienced a steady rate of improvement over the last decade. To continue this positive trend into the next millennium, Missouri will also have to balance the needs of the environment with the needs of industry. The state must examine ways to promote economic growth without compromising air quality, which means improvements will need to be made within existing industry. Missouri and the industrial community will have to work together to clean the air.

Everyone has a stake in keeping Missouri's air clean, and everyone can participate in accomplishing this goal. The next time your favorite powerhouse hitter fills his lungs, let's make sure it's with clean Missouri air.

As a recipient of federal funds, the Missouri Department of Natural Resources does not discriminate on the basis of race, color, religion, national origin, age, sex, or disability. Any person who believes he or she has suffered discrimination may file a complaint with the Department of Natural Resources or with the Office of Equal Opportunity, U.S. Department of the Interior, Washington, D.C., 20240.



2000 Air Quality Highlights

Ground-Level Ozone in St. Louis

Although summer 2000 had more days when weather conditions were favorable to the formation of ground-level **ozone** than in 1999, the St. Louis **ozone nonattainment** area had fewer days when **ozone** actually reached these high levels. In the entire 2000 **ozone** season, only one **ozone exceedance** occurred in the St. Louis area. This reflects a dramatic improvement in St. Louis air quality since monitoring began in 1978, when 126 **exceedances** were reported!

The photographs at the right show St. Louis on both good and bad air quality days. These pictures were taken by a camera maintained by the Missouri Department of Natural Resources' Environmental Services Program (ESP) from the top of the Hill district in St. Louis. Current photographs are available on the department's Web site at www.dnr.state.mo.us/deq/esp/esp_aqm.htm.

Though visual air pollution is not a direct measure of specific air pollutants, it can give the viewer an indication of the air quality. When weather conditions are favorable to the formation of **ozone**, they are often also favorable to the formation of other pollutants that limit visibility.

St. Louis has implemented several control strategies in recent years to reduce ground-level **ozone**, including use of a cleaner-burning **reformulated gasoline**. Through another program, Stage II vapor recovery, special nozzles have been placed on all area gasoline pumps to catch fumes during re-fueling. The St. Louis community also recently launched a new vehicle emissions inspection program, which is described in greater detail at right.

The department's Air Pollution Control Program would like to thank the many St. Louis area residents who made voluntary choices to help reduce **ozone**, such as carpooling, waiting to fill their cars up until after 5:30 p.m. on poor air quality days, taking the bus and avoiding use of charcoal lighter fluid. For more information regarding ground-level **ozone** in St. Louis, see Page 6.

Gateway Clean Air Program

The 2000 launch of the Gateway Clean Air Program headlined Missouri's efforts to bring St. Louis into **attainment** with the U.S. Environmental Protection Agency's (EPA) **ozone** regulations. The new program tests vehicles in the city of St. Louis and St. Louis, St. Charles and Jefferson counties using a new enhanced emissions testing procedure. For the first time, Franklin County also began vehicle emissions testing in 2000, using an improved basic idle emissions test.

The Department of Natural Resources contracted with Environmental Systems Products Inc. (ESP Missouri) to implement the Gateway Clean Air Program. ESP Missouri constructed and operates the new vehicle emissions testing facilities. The new facilities began testing vehicles in April 2000. ESP Missouri also operates RapidScreen, which uses remote sensing devices to monitor exhaust emissions while vehicles are driven on roads and highways. RapidScreen enables the very cleanest-running vehicles to pass the new emissions test without visiting emissions testing stations. More information on the Gateway Clean Air Program is available in the special Gateway Clean Air Program section on Page 6.

Good Air Quality



Poor Air Quality



Fuels

The Missouri Department of Natural Resources continues to develop ways for St. Louis and Kansas City to reduce emissions of volatile organic compounds (VOCs) that contribute to the formation of ground-level **ozone** (smog). St. Louis is required to reduce VOCs due to its status as an **ozone nonattainment** area, while the Kansas City reductions are in response to violations of the federal health-based **ozone** standard in 1995 and 1997.

Stage II Vapor Recovery has been shown to be one of the most effective means of reducing **ozone** violations. The Missouri Department of Natural Resources has developed the Missouri Performance Evaluation Test Procedures (MOPETP) to ensure that the Stage I and II vapor recovery equipment used in the St. Louis **ozone nonattainment** area are at least 95 percent efficient. The MOPETP is a comprehensive set of tests designed to determine the efficiency of gasoline vapor recovery systems and components.

As of Jan. 1, 2001, only MOPETP-approved systems and components are authorized for use in the St. Louis **ozone nonattainment** area. In addition to reducing the release of pollutants that contribute to the formation of **ozone**, these nozzles also capture

air toxins that customers would be exposed to during refueling.

The permitting process is designed to ensure that vapor recovery equipment continues to function properly after being installed. To date, all gasoline dispensing facilities in the St. Louis **ozone nonattainment** area have applied for and received an initial operating permit. Facilities must pass operating permit tests prior to receiving a renewed operating permit. Operating permits are renewed for a five-year period.

Federal **reformulated gasoline (RFG)** has been required at retail gasoline stations in the St. Louis **ozone nonattainment** area since June 1, 1999.

Federal **RFG** is a gasoline formula designed to burn cleaner by adjusting the amount of various components already found in conventional gasoline. **RFG** is required all year, not just during the summer. It reduces exhaust emissions as well as evaporative emissions and is administered and enforced by the U.S. EPA. Phase II of the **RFG** program, which began Jan. 1, 2000, requires additional emission reductions compared to Phase I **RFG**. Phase II **RFG** requires a minimum of 25 percent VOC reductions, a 20 percent reduction in air toxics, and a 5 to 7 percent reduction in **NOx** emissions. Ethanol use in the St. Louis area has increased since the introduction of federal **RFG**. During


the winter season, as much as 35 to 40 percent of St. Louis area **RFG** is blended with ethanol.

In 2000, low Reid Vapor Pressure (RVP) gasoline continued to be used during the summer months in the Kansas City **ozone** maintenance area. During summer months, low RVP gasoline evaporates less than conventional gasoline, which reduces emissions of VOCs. Low RVP gas was first required in St. Louis in 1994 and in Kansas City in 1997.

On Jan. 4, 2000, the use of federal **RFG** in Kansas City was blocked by a U.S. Court of Appeals decision to revoke the U.S. EPA's rulemaking that allowed former **ozone nonattainment** areas, such as Kansas City, to opt-in to the federal **RFG** program. As a result of the court decision, an amendment to lower the Kansas City summer RVP requirement from 7.2 pounds per square inch (psi) to 7.0 psi beginning June 1, 2001, was proposed in late 2000. The 7.0 psi RVP requirement is one of several emission control measures necessary for Kansas City to maintain compliance with the national **ozone** standard.

Ozone Transport

Because air pollution can spread across geographic boundaries, initiatives involving regional cooperation and study of air quality are becoming more common. In October 1998, the



U.S. EPA issued a rule, known as the Oxides of Nitrogen (**NO_x**) **State Implementation Plan (SIP)** Call. This **NO_x SIP** Call would have required Missouri to reduce emissions of **NO_x**, a commonly transported air pollutant that contributes to **ozone** formation.

After several legal challenges, the U.S. EPA's **NO_x SIP** Call is only effective for 19 of the 22 originally named states, excluding Missouri, Georgia and Wisconsin. The U.S. EPA's modeling showed that Missouri contributes to **ozone** problems in Illinois, Indiana, Michigan and Wisconsin. On Aug. 30, 2000, the U.S. Court of Appeals for the D.C. Circuit agreed with an industry's group motion to extend the deadline for implementation of the **NO_x SIPs** for the 19 states affected by the **SIP** call. The deadline has been moved from May 1, 2003, to May 31, 2004.

The U.S. EPA intends to propose a **NO_x SIP** Call to include part of Missouri in early 2001, requiring Missouri to submit a revised state air quality plan. This rulemaking will provide some additional answers about implementation dates for Missouri's sources as well as any additional **NO_x** regulations that will be required. Missouri's statewide **NO_x** rule, adopted by the **Missouri Air Conservation Commission** May 25, 2000, is intended to improve air quality in the St. Louis **ozone nonattainment** area. Missouri's statewide **NO_x** rule, 10 CSR 10-6.350, will reduce the emissions of **NO_x** from electric generating units and establish a **NO_x** emissions trading program for the entire state of Missouri.

The state of Missouri anticipates that the U.S. EPA will publish a **NO_x SIP** Call in the first quarter of calendar year 2001. At that point Missouri will need to evaluate the current statewide **NO_x** regulation and the **NO_x SIP** Call to determine what Missouri's response will be.

Cooperative Development of Regulations

Involving the public in the process of making air quality rules helps to create fair, effective regulations that have broad support. In 2000, the Missouri Department of Natural Resources continued its commitment to public participation by convening workgroups to help develop air regulations. A workgroup brings industry, the public, and government agencies together to share concerns and exchange ideas and data while developing regulations.

The department continued to implement the recommendations of the Construction Permit Streamlining Workgroup. The recommendations improve the Construction Permit Regulations and the internal procedures and policy for the program to review permit applications. The department has committed to reconvening this workgroup in 2001.

The department also worked with leaders from industry, environmental organizations and local governments to improve air quality in the Kansas City area. The department participated as a member of the Mid-America Regional Council, a metropolitan planning organization, in the development of an air quality improvement plan for the Kansas City **ozone** maintenance area which includes Johnson and Wyandotte counties in Kansas and Clay, Jackson and Platte counties in Missouri.

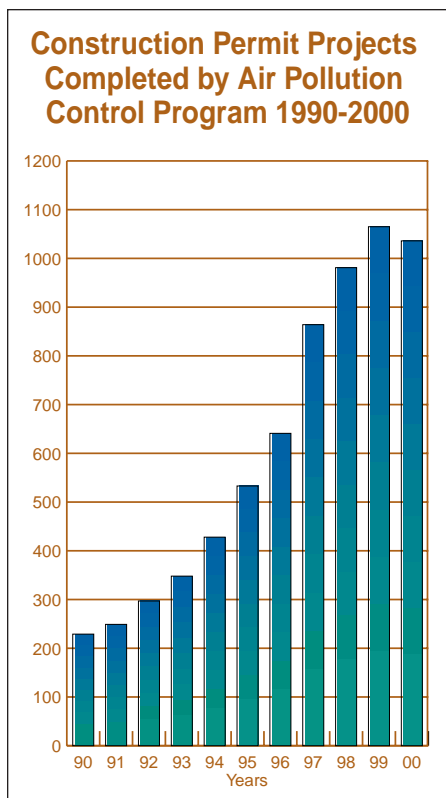
The department actively participates in air quality meetings of the two major metropolitan planning organizations, East-West Gateway Coordinating Council in St. Louis and Mid-America Regional Council. At these public meetings, the department provides updates on air quality projects and discusses proposed rules and plans with other participants.

Operating Permits

In 2000, declining staff numbers slowed the Operating Permit Unit's progress toward getting all the initial Part 70 State Installation Operating Permits issued. Progress was made, however, and the unit's operating permit status at year's end was that 354 Part 70 Operating Permits, or 78 percent, had completed technical and peer review, had been issued or were closed out. Permits that had undergone technical and peer review will still need to be reviewed by the public and the U.S. EPA. This process normally can be completed in two to three months, although objections received by the Air Pollution Control Program can slow this process.

Construction Permits

Among the 1,036 construction permit actions made in 2000, notable major level construction permits were issued for: University of Missouri-Columbia Power Plant; Duke Energy-Bollinger, LLC; Duke Energy-Audrain; Silgan Containers Manufacturing Corp; and Silgan Containers Manufacturing Corp.



Enforcement Actions and Results

The department's Air Pollution Control Program performed 1,686 stationary source inspections in the 2000 calendar year. The department's program also issued 1,020 Notices of Violation (NOVs) in 2000. Settlements were reached in 146 cases. These settlements resulted in paid penalties of \$309,760 and suspended penalties totaling \$262,400. The department referred 20 cases to the attorney general's office.

Asbestos

Federal regulations require that all buildings must be inspected for the presence of asbestos-containing materials (ACM) before they are renovated or demolished. The inspection must be conducted by a Missouri-certified inspector. In most cases ACM must be removed before beginning renovation or demolition.

Owners or contractors of demolition or renovation operations must submit a notice of intent to demolish or renovate a structure to the department's Air Pollution Control Program 10 working days prior to start of operation for review and approval. Single family homes of four or fewer dwelling units are not subject to the regulations. However, when more than one residential structure is involved on the same city block per one-year period, or if the residential structure will be used for fire training, the regulations apply.

The Small Business Compliance Advisory Committee

Small businesses are often focused on their day-to-day operations and may find it difficult to keep up with changing air pollution regulations and requirements. Section 507 of the 1990 Federal Clean Air Act Amendments recognized this and required states to develop a three-component

assistance program to help. The three components are a small business ombudsman, a technical assistance program for small businesses and a compliance advisory panel. In Missouri, the compliance advisory panel is known as the Small Business Compliance Advisory Committee.

The Small Business Compliance Advisory Committee is composed of seven members. Two are appointed by the governor, one each is appointed by the majority and minority leaders of the Missouri House and Senate, and one is appointed by the director of the Missouri Department of Natural Resources. The committee has the following responsibilities:

- Receive reports from the small business ombudsman (governor's office);
- Evaluate the impact on small business of the Air Conservation Law and related regulations;
- Make recommendations to the Missouri Department of Natural Resources, the **Missouri Air Conservation Commission** and the General Assembly regarding changes in procedure, rule or law that would help small businesses comply with the Air Conservation Law;
- Make recommendations to the **Missouri Air Conservation Commission** on rules to expedite the review of modifications for small business; and
- Conduct hearings and make investigations consistent with the purposes of the small business technical assistance activities.

Currently there are five individuals on the committee: Jack Lonsinger, chair, Excelsior Springs; Bruce Morrison, St. Louis; Caroline Pufalt, St. Louis; Joel Braun, Fenton; and Walter Pearson of the Missouri Department of Natural Resources. The committee met four times in 2000 and dealt with a variety of issues from small agricultural incinerators to open burning.



The small business technical assistance activity is performed by the department's Technical Assistance Program, a non-regulatory service of the Missouri Department of Natural Resources. The Technical Assistance Program's business assistance unit carries out the activities and provides administrative support to the Small Business Compliance Advisory Committee. The mission of the department's Technical Assistance Program is to provide information, assistance, education and training to business owners, farmers, local governments and the general public on how to control or reduce pollution. For more information, contact the department's Technical Assistance Program at 1-800-361-4827 or (573) 526-6627.

Number of Missouri Nonattainment Areas Dwindles in 2000

In the last quarter century since the department's Air Pollution Control Program was created, the state has been able to bring several areas into **attainment** with the **National Ambient Air Quality Standards (NAAQS)**. The Kansas City area polluted beyond federal health standards for **ozone** for many years, but in 1992, it was redesignated as an **ozone** maintenance area. The Kansas City area now works hard to maintain this status. Use of cleaner gasoline, along with industrial controls, has helped keep air clean in Kansas City.

The St. Louis area is still struggling to come into compliance with federal health standards for ground-level **ozone**, and has implemented a variety of programs to help make this happen. The Department of Natural Resources is confident that the area will achieve the **ozone** standard, since the St. Louis community has been very successful in resolving

other air quality problems. In the past, portions of St. Louis have been in **nonattainment** for **carbon monoxide**, **sulfur dioxide** and particulate matter, but these pollutants have since been controlled, and the area is now in **attainment** for all pollutants except **ozone**. Extensive computer modeling by the department has shown that the area will attain standards for **ozone** by 2003.

Portions of St. Joseph were once designated as a **nonattainment area** for particulate matter, but air in this area has since been restored and now is in compliance with federal standards.

On Dec. 18, 2000, the U.S. EPA announced the redesignation of a **lead nonattainment** area in western Iron County. This area is now considered to be in **attainment** of federal health-based standards for **lead**. Air quality near a **lead smelter** in Buick once exceeded the **NAAQS**. However, Department of Natural Resources staff developed a plan that ultimately brought this area back into compliance with these health standards. Department officials also worked closely with the operator of a different **lead smelter** near Glover, Missouri, to solve air quality problems near the facility. This area has been meeting federal air quality standards since the start of 1997, and there are plans to consider redesignation of this area back to **attainment** soon. Air quality near a third **lead smelter located in Herculaneum** continues to exceed federal health standards. Working closely with the company the department has developed a plan to bring this area into **attainment** as well. The plan calls for the enclosure of buildings and the construction of ventilation and filtration systems. Construction of these controls is scheduled for completion in July 2002.

Gateway Clean Air Program

On April 5, 2000, the Gateway Clean Air Program's 12 new state-of-the-art emissions testing stations opened their doors, ready to begin the newest job in the fight for cleaner air quality in the St. Louis metropolitan area. Some motorists were already receiving mailed notices that their very clean-running vehicles had passed an unobtrusive roadside test called RapidScreen.

Along with more stringent emission controls on industrial sources, an improved vehicle emission inspection and maintenance program was crucial to the state's plan to bring the area into compliance with the air quality health standards of the Clean Air Act.

In February 1999, a contract was signed with Environmental Systems Products (ESP Missouri), the nation's largest vehicle emissions testing contractor, to build and operate the test stations under the state's oversight.

Missouri's contract with ESP Missouri calls for most of the 1.2 million vehicles of the St. Louis area to receive an emissions test every two years. Even-year vehicles are being tested in even-numbered years and odd-year vehicles will be tested in odd-numbered years, except in Franklin County, where an annual basic idle test is required. The two newest model-year vehicles are

RapidScreen

One Second is All it Takes

RapidScreen is a convenient option under the Gateway Clean Air Program that allows motorists to pass the new emissions test without visiting an emissions station. Special infrared and ultraviolet light technology is used to take an unobtrusive "snapshot" of exhaust emissions while vehicles are driven on streets and highways. This new technology has proven to be effective for on-road identification of very clean vehicles. According to the U.S. Environmental Protection Agency, the St. Louis program is the first program in the country to employ "remote sensing" to screen such a

large number of vehicles. As a result of Missouri's initial success with RapidScreen, other states are beginning to look at using this kind of technology to make their own test programs more convenient.

Motorists who receive two successive clean records within 12 months before their registration month are notified by mail. They can then call or send in their test fees. The Gateway Clean Air Program has been designed so that about 40 percent of vehicles won't even have to go to a station. The RapidScreen component of the program rewards those people who maintain their vehicles extremely well, allowing them to skip a trip to the test station.

You've Passed!

The vehicle listed below has license plates that will expire next month. An emissions test is required before the license plate can be renewed. **The vehicle below was remotely tested or screened and has passed its emissions test.** You should redeem this notice by following the instructions below.

To skip a trip to an emissions station and receive your emissions sticker
Call toll-free 24 hrs:
1-888-748-6-Air (247)

Have this notice and your credit card with you when you call. Enter the RapidScreen number printed in the blue box below, and your credit card information when prompted. It's as easy as that, and your emissions sticker will be sent to you by mail in about fourteen business days. If you no longer own the vehicle described, please disregard this notice.

This notice cannot be used to register your vehicle. This notice expires on the date printed in the blue box with your RapidScreen number. If you do not send in payment by that time, you will need to visit an emissions test station to have your

www.gatewaycleanair.com

Or mail this reply card with your payment

Using the included envelope, mail your credit card information, check or money order* payable to the Gateway Clean Air Program plus this portion of the notice to:

RapidScreen Return Center
P.O. Box 1034
St. Charles, MO 63302-1034

Charge my: ☐ Visa ☐ MasterCard

Card No.: _____

Expiration Date: _____

Signature: _____

*If paying by check or money order, please write your license plate number on the check or money order.

Make: _____
Model Year: _____
Model: _____
Plate Number: _____
VIN: _____

Rapid Screen #:	Due Date:
_____	_____
Confirmation Code:	

Remove reply card at perforations

exempted from testing. As of Dec. 31, 2000, ESP Missouri had tested 567,343 vehicles through a combination of fixed stations, mobile vans and RapidScreen.

This program is the corner-stone of the state's efforts to reduce ground-level **ozone**, a harmful pollutant that irritates the respiratory system and is

Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOCs). These regulations are applied to industrial facilities, on-road and off-road mobile sources and smaller area sources such as auto painting shops and dry cleaners.

Large trucks and buses emit large quantities of pollutants, but they are

not included in the program for two reasons. First, they emit relatively low amounts of the volatile organic compounds that form ground-level **ozone**, which is the air quality problem of most concern in St. Louis.

Also, many of these vehicles are transient in nature and impossible to regulate at the state level. The federal

government

is setting standards for new manufactured and rebuilt diesel engines and standards to make diesel fuel cleaner.

Although motorists can still repair their own vehicles or have repairs

done where they choose, special training is available for repair technicians throughout the region. Those who complete the training are "recognized repair technicians" listed in a booklet provided to motorists whose vehicles fail a test. The shop's labor charges may be counted toward the spending requirements for a waiver. The waiver is issued only if the vehicle fails a retest and valid emission repairs and expenditures have been made. By repairing their vehicles, owners not only make a significant contribution to protecting the air we breathe, but they also ensure that their vehicles will run better, last longer and use less gasoline, saving motorists money in the long run.

Emissions testing by the Gateway Clean Air Program has been designed to double the emission reductions of the previous program while providing the greatest possible convenience to the public. Each month the program has performed about 50,000 station-based tests and mailed approximately 60,000 RapidScreen notices.

While RapidScreen is a phone and mail-in system, the department has added capabilities at the stations to process motorists who have passed RapidScreen. This, along with other improvements in efficiency, has made long waits rare, even at the end of the month. Most motorist wait less than 15 minutes.

For more information about the Gateway Clean Air Program, visit the program's Web site at [www.gatewaycleanair.com]. St. Louis area motorists also may call toll free 1-888-748-1AIR (1247).



particularly harmful to children, the elderly and anyone working or exercising outdoors. Getting control of the St. Louis **ozone** problem requires cutting down the emissions of major and minor sources of harmful

Major Air Pollutants

The measurements for air quality in Missouri are the **National Ambient (outdoor) Air Quality Standards** established by the U.S. EPA under the Clean Air Act. The standards address six “criteria pollutants” considered harmful to public health and the environment: **ozone**, **lead**, **inhalable particles**, **carbon monoxide**, **nitrogen dioxide** and **sulfur dioxide**.

Ozone

Ground-level **ozone** is a colorless gas, the most harmful part of urban air pollution. **Ozone** is not directly emitted but it forms on hot summer days when sunlight causes a reaction between **volatile organic compounds (VOC)** and **nitrogen oxides (NO_x)**. Vehicles, power plants and industrial boilers are common sources of **NO_x**. Gasoline-powered vehicles and manufacturing operations are major sources of **VOCs**.

There are two types of **ozone**: stratospheric (upper atmosphere) and ground-level **ozone**. **Ozone** in the stratosphere occurs naturally and is desirable, shielding the earth from harmful ultraviolet rays. **Ozone** at ground level irritates the respiratory system, causing congestion, chest pains, nausea and labored breathing. It also aggravates existing lung and heart conditions such as asthma.

Airborne Lead

In Missouri, airborne **lead** and its compounds are produced mainly by **lead smelters**. Airborne **lead** poses the greatest danger to children under age six, so the standard has been established to protect their health. In 1985, 73 percent of airborne **lead**

came from vehicle exhaust pipes. By 1988, this had dropped to 34 percent due to federal controls on gasoline that started in the mid-1970s.

Inhalable Particles

Inhalable particles include airborne dust, pollen, soot and aerosol sprays. Scientists refer to these as “particulate matter.” Current federal standards apply to particles less than 10 microns in diameter, or **PM₁₀**. Wind and rainfall cause seasonal variations in **PM₁₀**. In 1997, the U.S. EPA set new standards for even smaller particles less than 2.5 microns in diameter, or **PM_{2.5}** (see Page 24).

Carbon Monoxide

Carbon monoxide (CO), formed by the incomplete combustion of fuel, is one of the most common pollutants. More than 75 percent of **CO** emissions come from vehicle exhaust. The highest concentrations are caused by heavy traffic in metropolitan areas. Though deadly, **CO** changes quickly to carbon dioxide, which is not dangerous.

Nitrogen Dioxide

Almost all **nitrogen dioxide** is man-made. When fuel is burned above 1200 degrees Fahrenheit, **nitrogen dioxide** can form. Principal sources of **nitrogen dioxide** include power plants, industrial boilers and vehicles.

Sulfur Dioxide

Sulfur oxides form through the burning of fuels that contain sulfur, such as coal and oil, by **smelting** metals and by other industrial processes. **Sulfur dioxide (SO₂)** composes about 95 percent of these gases.

Other Air Pollutants

In addition to the six criteria pollutants, the Department of Natural Resources’ Air Pollution Control Program also regulates other pollutants, including asbestos and hazardous air pollutants.

Asbestos

Asbestos is a naturally occurring mineral that takes the form of hollow microscopic fibers. Before being identified as a cancer-causing agent, asbestos was widely used for insulation and fireproofing. With age, it breaks down and becomes a hazard to anyone who breathes its airborne fibers. Federal and state laws regulate the removal of asbestos from buildings. The Department of Natural Resources monitors removal.

Hazardous Air Pollutants (HAPS)

Some air pollutants can cause quick and painful death, cancer, reproductive disorders and environmental damage such as acid rain. The U.S. EPA has designated these pollutants as hazardous air pollutants. These pollutants may present a hazard to public health and safety if released in sufficient quantity.



Clean Air Standards

The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as children, elderly and those with respiratory illnesses. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings.

New Standards

In 1997, the U.S. Environmental Protection Agency (EPA) established new health-based standards for ground-level **ozone** and fine particulate matter. Extensive scientific review showed that the changes were necessary to protect public health and the environment. However, the new standards were challenged in court. In May 1999, the U.S. Court of Appeals for the District of Columbia Circuit declared that the new standards are not enforceable. Therefore, the standards cannot be implemented at this time. However, the U.S. EPA appealed most of this decision to the U.S. Supreme Court. Arguments were heard Nov. 7, 2000, and a decision is expected in spring 2001.

Fine Particulate Matter: PM_{2.5} versus PM₁₀

In revising the air quality standards, the U.S. EPA created new standards for **PM_{2.5}** (particulate matter less than 2.5 microns in diameter). The U.S. EPA’s scientific review concluded that fine particles (**PM_{2.5}**), which penetrate deeply into the lungs, are more damaging to human health than the

coarse particles known as **PM₁₀**. Fine particles are more likely than coarse particles to contribute to such health effects as premature death, increased hospital admissions and emergency visits, especially for the elderly and individuals with cardiopulmonary disease. Coarse particles can accumulate in the respiratory system and aggravate health problems such as asthma.

Air Quality Monitors in Missouri

In 2000, the Missouri Air Pollution Monitoring Network included 111 monitors of three types: national monitors, state and local agency monitors and special-purpose monitors. National monitors have been established to provide data on national trends. State and local agencies operate permanent monitors to measure ambient concentrations of those pollutants for which **National Ambient Air Quality Standards** have been set. Special-purpose monitors are placed to gather representative data as well as worst-case occurrences. Data is also being collected at 44 meteorological monitors operating throughout the state. The data collected at these monitors are used for analysis and modeling purposes.

National Ambient Air Quality Standards

CRITERIA AIR POLLUTANT	AVERAGING TIME	PRIMARY STANDARD	SECONDARY STANDARD	HEALTH EFFECTS
Carbon Monoxide	Eight-hour maximum ^a	9 ppm (10 mg/m ³)	None	Impaired vision and manual dexterity, weakness and mental dullness. At high levels: vomiting, fast pulse and breathing, followed by slow pulse and breathing, then collapse and unconsciousness.
	One-hour maximum ^b	35 ppm ^d (40 mg/m ³) ^c	None	
Lead	Maximum Quarterly Arithmetic Mean	1.5 µg/m ³	Same As Primary Standard	Low doses damage the central nervous system of children and unborn infants, causing seizures, mental retardation and behavioral disorders. In children and adults lead causes fatigue, disturbed sleep, decreased fitness and damage to kidneys, liver and blood-forming organs. High levels damage the nervous system and cause seizures, coma and death.
Nitrogen Dioxide	Annual Arithmetic Mean	0.05 ppm (100 µg/m ³)	Same As Primary Standard	Lung inflammation and lower resistance to infections like bronchitis and pneumonia. Suspected of causing acute respiratory diseases in children.
Ozone	One-hour average ^b	0.12 ppm (235 µg/m ³)	Same As Primary Standard	Throat irritation, congestion, chest pains, nausea and labored breathing. Aggravation of existing lung or heart conditions, allergies and asthma-. Ozone is especially harmful to those who work or play outside. Ozone is also harmful to plant life, damaging forests and reducing crop yields.
Particulate Matter (PM₁₀)	Annual Arithmetic Mean	50 µg/m ³	Same As Primary Standard	Increased likelihood of chronic or acute respiratory illness. Difficulty breathing, aggravation of existing respiratory or cardiovascular illness and lung damage.
	24-hour average ^f	150 µg/m ³		
Sulfur Dioxide	Annual Arithmetic Mean	0.03 ppm (80 µg/m ³)	0.5 ppm (1300 µg/m ³)	Irritation of throat and lungs with difficulty in breathing. Aggravation of existing respiratory or cardiovascular illness.
	24-hour maximum ^a	0.14 ppm (365 µg/m ³)		
	Three-hour maximum ^b			

^a Not to be exceeded more than once a year for primary and secondary standards.

^b Not to be exceeded more than once a year for primary and secondary standards.

^c mg/m³ = milligrams per cubic meter.

^d ppm = part per million.

^e g/m³ = micrograms per cubic meter.

^f Established for a three-year average of the 99th percentile of data.

^g Established for a three-year average.

^h Established for a three-year average of the 98th percentile of data.

Air Quality Monitoring Sites in Missouri

ENVIRONMENTAL SERVICES PROGRAM

SITE	SITE NAME
01	South 759 Hwy St Joseph
02	St. Joseph Levee
03	12th and Mitchell St Joseph
04	El Dorado Springs
05	Watkins Mill State Park
06	Hwy 33 & County Home Liberty
07	North Kansas City
08	Sugar Creek
09	Mercer County
10	Mountain View
11	DRG Hogan
12	DRG Dunn
13	DRG Tindell
14	DRG Hogan Mountain
15	Carthage Stone
16	DRH Dunklin High School Herculaneum
17	Arnold Tenbrook & Tenbrook
18	DRH SO2 Herculaneum
19	Festus
20	Lincoln South
21	Lincoln North
22	Mark Twain State Park
23	Hwy 94 West Alton
24	Orchard Farm
25	Bonne Terre
26	Ste Genevieve

KANSAS CITY AIR QUALITY

SITE	SITE NAME
27	2600 NE Parvin Rd
28	49th & Winchester WOF
29	724 Troost
30	27th & Van Brunt
31	Richards Gebaur South
32	4928 Main Street
33	800 Broadway
34	1517 Locust
35	11500 North 71 Hwy KCI

SPRINGFIELD-GREENE COUNTY APC

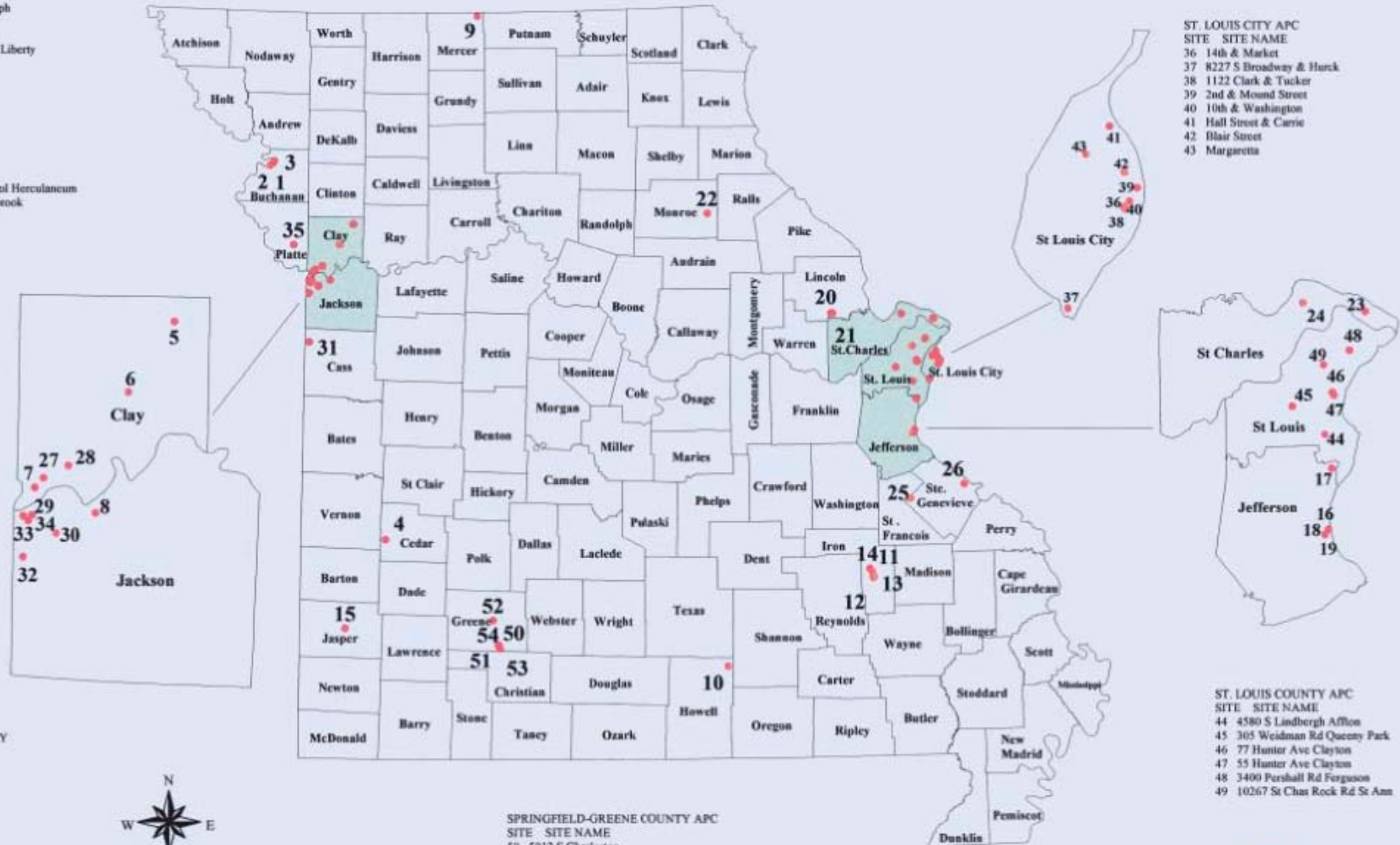
SITE	SITE NAME
50	5012 S Charleston
51	Southwest MO State
52	Hillcrest School
53	James River South
54	1555 S Glenstone

ST. LOUIS CITY APC

SITE	SITE NAME
36	14th & Market
37	8227 S Broadway & Hurck
38	1122 Clark & Tucker
39	2nd & Mound Street
40	10th & Washington
41	Hall Street & Carrie
42	Blair Street
43	Margaretta

ST. LOUIS COUNTY APC

SITE	SITE NAME
44	4580 S Lindbergh Afflon
45	305 Weidman Rd Queeny Park
46	77 Hunter Ave Clayton
47	55 Hunter Ave Clayton
48	3400 Pershall Rd Ferguson
49	10267 St Char Rock Rd St Ann



Missouri's Air Quality

Two exceptions to good air quality in Missouri are the St. Louis area during the summer and one spot in eastern Missouri. The St. Louis area has repeatedly exceeded the **ozone** standard and is designated by the U.S. Environmental Protection Agency (EPA) as a moderate-level **nonattainment area** for **ozone**. This area includes the city of St. Louis and Franklin, Jefferson, St. Charles and St. Louis counties (see Page 17), as well as Madison, Monroe and St. Clair counties in Illinois. A small area near a **lead smelter** in

Jefferson County still exceeds federal standards for **lead** (see Page 22).

Air Quality Trends

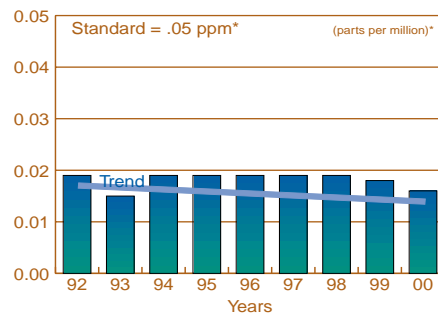
The department monitors air concentrations of the six criteria pollutants at selected locations throughout the state. Most areas of the state are in **attainment** of the air standards.

The graphs below are representative of general trends of ambient air data from four pollutants CO, NO_x, SO_x and PM₁₀. Please see Major Air Pollutants on Page 9 for more information on sources of these pollutants

Air Quality Trends at Selected Locations

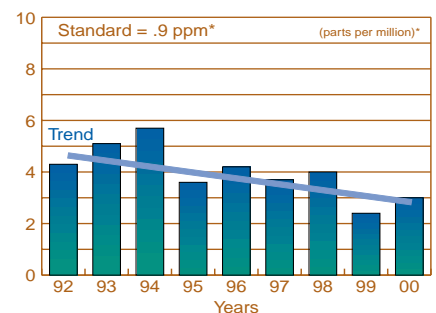
NITROGEN DIOXIDE ANNUAL MEAN, ppm

South Lindbergh, Affton 1992-2000



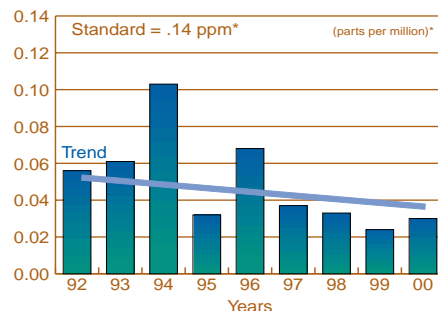
CARBON MONOXIDE 2nd 8-hr MAX, ppm

St. Charles Rock Road, St. Ann 1992-2000



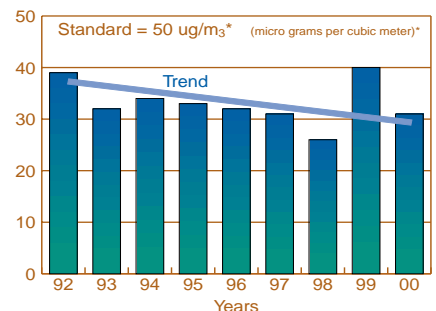
SULFUR DIOXIDE 2nd 24-hr MAX, ppm

South Charleston, Springfield 1992-2000



PM10 ANNUAL MEAN, ppm

St. Joseph, Missouri 1992-2000



and their health effects. The overall trend as shown by the four graphs at left is improved air quality.

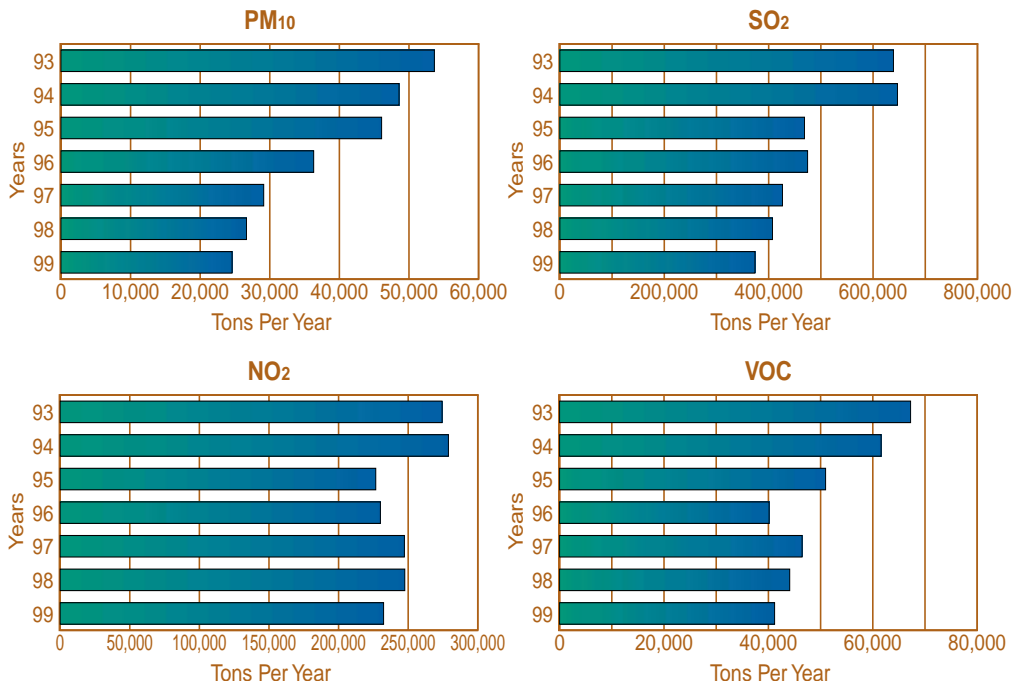
Emission Trends

In 1999, Missouri expanded its emission inventory submittal to the U.S. EPA to add area and mobile sources to the point source information. Area sources are the smaller businesses and local and regional activities such as pesticide applications, highway painting and open burning. On-road mobile sources encompass passenger and commercial vehicles, while off-road mobile sources include construction equipment, motorized recreation vehicles and small machines like lawnmowers.

The graphs at right show the total emissions of the criteria pollutants that Missouri facilities reported for the years 1993 to 1999. As reflected in the graphs, facilities have generally reported decreased emissions. Since 1993, facilities have reduced **PM₁₀** emissions 54 percent, while **VOC** emissions have dropped 39 percent. **Sulfur oxide** emissions dropped 42 percent since 1993. Industries have also reported a 15 percent decline in the emission of **NO_x** since 1993.

NO_x emissions are expected to continue to decline between now and the year 2007. The U.S. EPA's **NO_x State Implementation Plan (SIP)** call, if promulgated for Missouri, will require a reduction in **NO_x** emissions of approximately 35 percent from the eastern one-third of Missouri. Missouri has a statewide **NO_x** rule that will achieve slightly more emission reductions from electrical generating units in the entire state. The tables at right show relative contributions from major industrial sources.

Annual Reported Emissions



Top Point Emission Sources for NO _x	Tons of NO _x contributed by these sources in 1999	Percent of total
(1) Electricity Generation	191,835.58	82.5%
(2) Cement Production	16,416.80	7.1%
(3) Lime Production	4,159.20	1.8%
(4) Oil and Gas Pipelines	3,826.30	1.6%
(5) All Others	16,184.25	7.0%
Total:	232,422.13	
Top Point Emission Sources for PM ₁₀	Tons of PM ₁₀ contributed by these sources in 1999	Percent of total
(1) Electricity Generation	5,269.71	21.4%
(2) Charcoal Production	3,239.24	13.1%
(3) Cement Production	2,549.97	10.3%
(4) Lime Production	2,125.12	8.6%
(5) Sand and Gravel Processing	1,885.36	7.6%
(6) All Others	9,590.81	38.9%
Total:	24,660.21	
Top Point Emission Sources for VOCs	Tons of VOCs contributed by these sources in 1999	Percent of total
(1) Charcoal Production	7,473.69	18.1%
(2) Motor Vehicle Production and Auto Body Finishing	3,891.80	9.4%
(3) Aluminum Foil Production	2,394.11	5.8%
(4) Cement Production	2,098.50	5.1%
(5) Plastics Production	1,786.39	4.3%
(6) Automobiles Production	1,744.11	4.2%
(7) Electricity Generation	1,501.01	3.6%
(8) All Others	20,479.26	49.5%
Total:	41,359.87	

Air Quality Index: Ozone

Index Values	Levels of Health Concern	Cautionary Statements
0-50	Good	None
51-100*	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101-150	Unhealthy for sensitive groups	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151-200	Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
201-300	Very unhealthy	Active children and adults, and people with respiratory disease such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
301-500	Hazardous	Everyone should avoid all outdoor exertion.

* Generally, an AQI of 100 for ozone corresponds to an ozone level of 0.08 parts per million (averaged over 8 hours).

Ozone in Missouri

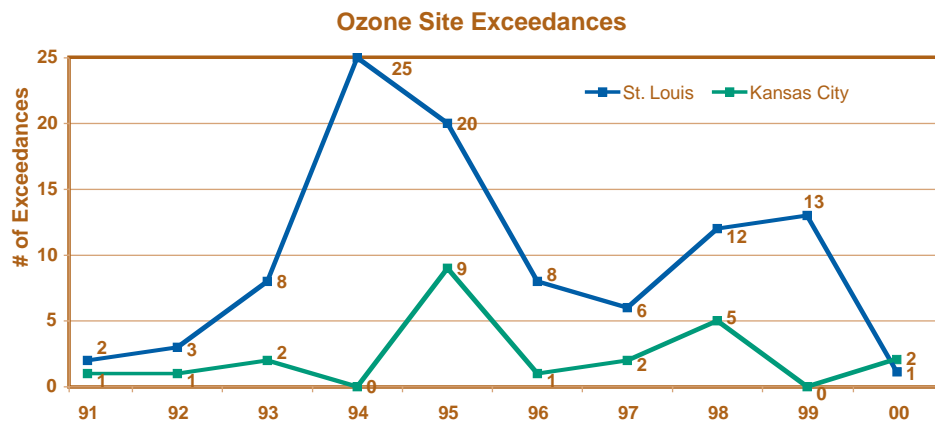
Naturally occurring **ozone** in the upper atmosphere protects the earth from the sun's harmful rays. Ground-level **ozone** is an irritant that damages lung tissue and aggravates respiratory disease. The pollutant is formed when heat and sunlight mix with volatile organic compounds (VOCs) and nitrogen oxide (NO_x) emissions in the lower atmosphere. **Ozone** can trigger a variety of health problems. Those most susceptible to **ozone** include children, the elderly and individuals with pre-existing respiratory problems. Even healthy young adults may experience respiratory problems at **ozone** levels as low as .08 parts-per-million (ppm) if they remain outdoors for extended periods. This could include individuals whose jobs require a great deal of time outdoors, such as road construction workers, or even individuals working in their lawns or gardens. The table at left describes the Air Quality Index (AQI), a system used to warn communities in St. Louis and Kansas City on days when their air may be dangerous to breathe. During the **ozone** season, between April 1 and Oct. 31, many radio and television stations in the St. Louis and Kansas City areas provide AQI information on a daily basis.

Number of Ozone Site Exceedances Reported

Approximately 4 million of Missouri's 5.4 million residents live in St.

Louis and Kansas City where the likelihood of **ozone** formation is greatest. The **National Ambient Air Quality Standard** of .12 ppm is often exceeded on hot, sunny summer days. The number of days **ozone** levels exceed this standard in a given year generally reflects both weather conditions and the pollutants in the area's air.

In 2000, the St. Louis **ozone nonattainment** area reported only one **exceedance** of the one-hour **ozone** standard. Kansas City reported two **exceedances**. The chart below shows the number of days St. Louis and Kansas City exceeded the ground-level **ozone** standard in the last decade. The chart on the right shows the number of days the St. Louis area exceeded the ground-level **ozone** standard in comparison to the number of days weather conditions were favorable for exceeding this standard. This chart reflects the importance of individual actions in controlling **ozone**. In recent years weather conditions have been favorable to the formation of high levels of **ozone** in the St. Louis area on several days. However, through carpooling, postponing mowing, avoiding use of charcoal lighter fluid and many other voluntary efforts, St. Louis area residents were able to prevent high **ozone** levels on many of those days.



OZONE IN ST. LOUIS

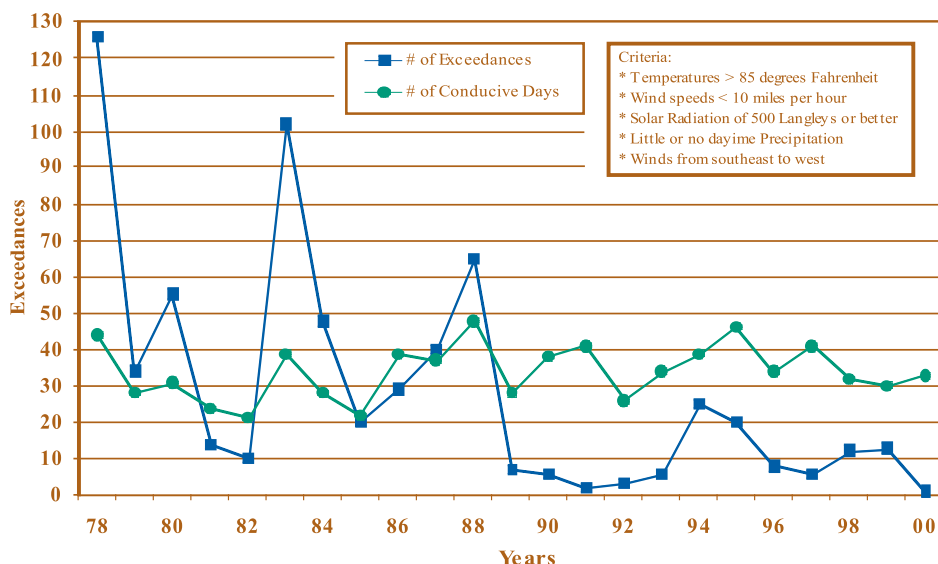
If four or more **exceedances** of the health-based standard for **ozone** occur at the same monitor in a three-year period, it is considered a **violation**, and the area is designated as **nonattainment**. **Nonattainment** areas are then divided into five classifications based on the severity of the **exceedances** that occurred at the monitor in a three-year period: marginal, moderate, serious, severe and extreme. Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has designated many areas in the country as **nonattainment** for **ozone**. In 1999, the St. Louis **ozone nonattainment** area was one of five areas nationwide classified as a moderate **ozone nonattainment** area.

The St. Louis **ozone nonattainment** area includes the city of St. Louis, and the counties of St. Charles, St. Louis, Jefferson and Franklin. The Illinois side includes Madison, Monroe and St. Clair counties. The map at right shows the sites for air monitors in the **ozone nonattainment** area.

St. Louis Ozone Nonattainment Area Monitoring Sites



St. Louis Nonattainment Area 1-Hour Ozone 1978 - 2000 Number of Exceedances vs Conductive Days



Exceedance: An **exceedance** occurs when levels of a certain pollutant are higher than those deemed safe by the federal government.

Violation: Four or more **exceedances** at the same air quality monitor in a three-year period equal a **violation**.

Nonattainment: An area that has had a violation is classified as **nonattainment**. **Nonattainment** areas are then divided into five categories: marginal, moderate, serious, severe and extreme.

CONTROLLING ST. LOUIS OZONE

Missouri's **State Implementation Plan (SIP)** for the St. Louis **ozone nonattainment** area includes control measures and schedules for compliance with the Clean Air Act in order to attain

the federal health-based standard for ground-level **ozone**. To reduce **ozone** concentrations to safe levels, the state must control both industrial and mobile sources of volatile organic compounds (VOC) and **nitrogen oxides (NO_x)**. Cars, trucks and buses are examples of mobile sources of VOCs. Major controls benefiting St. Louis recently included a vehicle emissions inspection and mainte-

Number of Days with Excessive Ozone - St. Louis Nonattainment Area

Number of One-Hour Exceedances

Site	Address	90	91	92	93	94	95	96	97	98	99	00
St. Louis	Missouri											
Arnold	Arnold and Tenbrook	0	0	0	0	2	2	1	1	1	1	0
West Alton	Highway 94	2	0	0	0	4	4	1	1	2	3	1
Orchard Farm							2	1	0	1	2	0
St. Louis	8227 S. Broadway	0	0	0	0	0	0	1	0	1	0	0
St. Louis	1122 Clark and Tucker	0	0	0	0	0	0	0	0	1	1	0
St. Louis	Newstead & Cote Brillante	1	0	0	0	0	1	0	0	0	0	0
Affton	South Lindbergh	1	1	2	2	2	0	1	1	1	0	0
Queeney Park	305 Weidman	0	0	0	0	5	1	0	0	1	1	0
Clayton	55 Hunter Avenue	1	0	1	0	3	0	0	0	1	1	0
Ferguson	3400 Pershall Road	0	0	0	0	2	1	0	1	1	1	0
St. Ann	10267 St. Charles Rock Road	1	0	0	0	4	1	0	0	1	1	0
	Illinois	90	91	92	93	94	95	96	97	98	99	00
Alton	409 Main Street	0	0	0	2	1	1	2	0	0	1	0
Maryville	200 West Division	0	0	0	1	1	1	0	0	0	0	0
Edwardsville	Poag Road	0	1	0	0	0	3	0	1	0	0	0
Wood River	54 North Walcott	0	0	0	0	1	2	1	1	0	1	0
East St. Louis	13th and Tudor	0	0	0	1	0	1	0	0	1	0	0
St. Louis Nonattainment Total		6	2	3	6	25	20	8	6	12	13	1

Number of Days with Excessive Ozone

St. Louis exceeded the **ozone** standard each summer between 1996 and 2000. The table above shows the number of days that sites in Missouri and Illinois reported exceeding the **ozone** standard. The St. Louis **ozone nonattainment** area reported only one **exceedance** of the one-hour standard during the 2000 **ozone** season (April 1 through October 31), which was a significant improvement from the 1999 **ozone** season, when 13 **exceedances** were reported.

nance program, Stage II vapor recovery systems for gasoline refueling, advanced emissions control systems for existing and new industrial sources and controls on NO_x emissions from utility boilers. Two control strategies leading to the greatest reductions in VOC emissions are enhanced vehicle inspection and maintenance and reformulated gasoline.

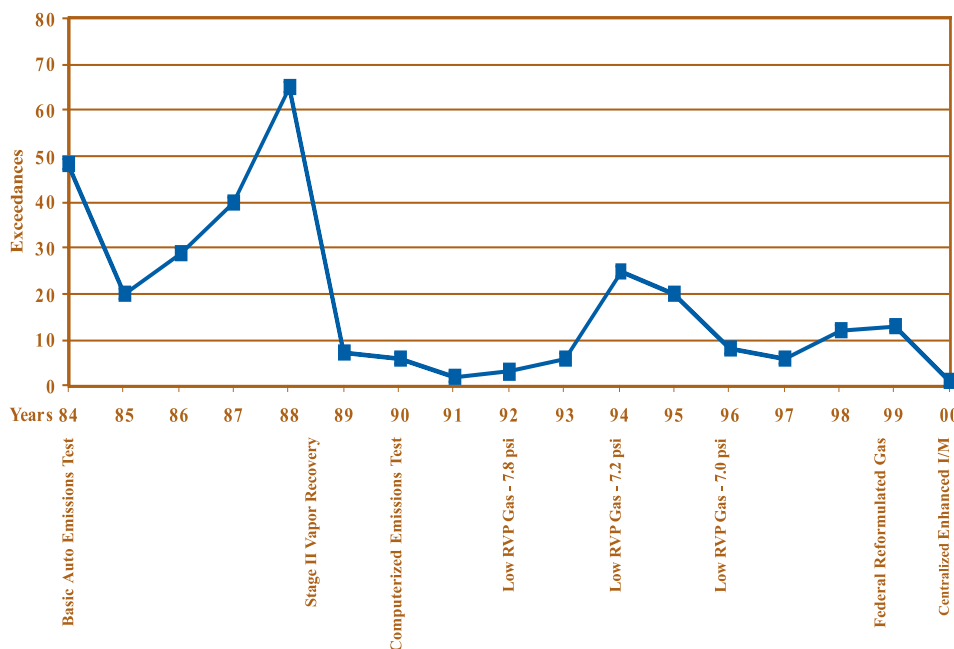
Vehicle Emissions Inspections

Programs for vehicle emissions testing and repair, or Inspection and Maintenance programs, are key mechanisms for controlling mobile source emissions in many urban regions nationwide. The Gateway Clean Air Program represents a large portion of the Department of Natural Resources' **state implementation plan** to bring St. Louis into compliance with the **National Ambient Air Quality Standards (NAAQS)** for **ozone**, or urban smog.

At the end of 1999, the state ended the previous program of testing vehicle emissions using the basic (idle) emissions test procedure that was combined with the annual safety inspection conducted at local car service facilities every year. In April 2000, the 12 new emissions testing stations of the Gateway Clean Air Program opened. These stations were built and the new program is operated under a state contract with Environmental Systems Products Inc. (ESP Missouri). For the first time, Franklin County also began vehicle emissions testing in 2000, using an improved basic (idle) emissions test.

The Gateway Clean Air Program uses new emissions testing technologies. An enhanced emissions test simulates real driving conditions on a dynamometer (treadmill-like device) during testing. This measures specific pollutants from vehicles much more

St. Louis Nonattainment Area 1-Hour Ozone 1984 - 2000
Exceedances/Major Control Implementation Start Dates



precisely than the older idle testing system. Stations performing the new tests cannot offer repair services. A second test, called RapidScreen, uses a remote sensing device to monitor exhaust emissions while vehicles are being driven on roads and highways. RapidScreen allows the very cleanest-running vehicles to pass the new emissions test without visiting emissions testing stations. For vehicles manufactured from 1971 through 1980, and for vehicles tested in Franklin County, an improved version of the idle test is used.

For more information on the Gateway Clean Air Program, see the special Gateway Clean Air Program section on Page 6 of this report. Additional information is also available by visiting the following Web sites: gatewaycleanair.com, www.dnr.state.mo.us/deq/apcp/gcap/ or www.cleanair-stlouis.com/gcap/.

Low Reid Vapor Pressure Gasoline and Reformulated Gasoline

Many volatile organic compound (VOC) control measures have been

used in the effort to reach **attainment** of the **ozone** standard. In 1994, low REID vapor pressure gasoline was implemented in St. Louis. Reid vapor pressure (RVP) is a measure of gasoline's tendency to evaporate into the air. Lowering RVP reduces evaporative emissions of gasoline. Between 1994 and 1998, a state regulation restricted the RVP of gasoline sold in the St. Louis **nonattainment** area during the warmest months of the year, June 1 through Sept. 15.

Federal reformulated gasoline (RFG) has been required at retail gasoline stations in the St. Louis **ozone nonattainment** area since June 1, 1999. **RFG** is a gasoline formula designed to burn cleaner than conventional gasoline, and to reduce exhaust and evaporative emissions by adjusting the amount of various components already found in conventional gasoline. **RFG** is administered and enforced by the U.S. Environmental Protection Agency (EPA). Phase II of the **RFG** program, which began Jan. 1, 2000, requires additional emission reductions compared to Phase I **RFG**. Phase II **RFG** requires a minimum of

25 percent VOC reductions, a 20 percent reduction in air toxics and a 5 to 7 percent reduction in NO_x emissions.

Area Reclassification (“Bump-Up”)

Moderate **nonattainment** areas were required to meet the **National Ambient Air Quality Standard** for **ozone** by Nov. 15, 1996. Because St. Louis failed to meet this goal, the area may be reclassified by the U.S. EPA, or “bumped up” in its **nonattainment** status from moderate to serious. In 1998, the U.S. EPA proposed a new policy that may allow St. Louis to obtain an **attainment** date extension. The department committed to meeting the requirements of the U.S. EPA’s policy. Under the policy, the Department of Natural Resources must demonstrate that St. Louis is affected by air pollution transported from upwind areas. Also, all required local control measures must be implemented and the department must submit an approvable **attainment** demonstration showing the area will attain the **ozone** standard.

On Nov. 12, 1999, the department submitted a package of regulatory requirements to the U.S. EPA including the Vehicle Inspection and Maintenance Plan, the 15 Percent Rate-of-Progress Plan, the **Attainment** Demonstration, seven reasonably available control technology (RACT) rules and a draft rule to reduce statewide emissions of **nitrogen oxides**. This package was followed by a June 29, 2000, submittal of a final rule to reduce statewide emissions of **nitrogen oxides** and amendments to the **attainment** demonstration. On April 17, 2000, the U.S. EPA proposed to extend the **attainment** date for St. Louis to 2003. This proposal has not been finalized.

One obstacle to the **attainment** date extension is a lawsuit filed in July 1998 by environmental groups against the U.S. EPA for failure to bump up the St. Louis area. Should this bump up occur, St. Louis would be obligated to meet the more stringent mandatory requirements for serious **nonattainment** areas.

Number of Days with Excessive Ozone - Kansas City Ozone Maintenance Area

Number of One-Hour Exceedances

Site	Address	90	91	92	93	94	95	96	97	98	99	00
Kansas City	Missouri											
Liberty	Hwy 33 and County Hwy	0	0	0	1	0	3	0	1	2	0	0
Lawson	Watkins Mill State Park Road	0	0	0	0	0	3	0	0	1	0	0
Kansas City	49th and Winchester WOF	1	0	0	0	0	2	0	0	0	0	0
Kansas City	Richards Gebaur AFB	0	1	0	0	0	0	0	0	0	0	1
Kansas City	11500 N. 71 Hwy KCI Airport	1	0	1	0	0	1	0	1	1	0	1
	Kansas	90	91	92	93	94	95	96	97	98	99	00
Wyandotte CO	Ann Avenue	0	0	0	1	0	0	1	0	1	0	0
Total		2	1	1	2	0	9	1	2	5	0	2

OZONE IN KANSAS CITY

The Kansas City area was designated as a sub-marginal **ozone nonattainment** area under the Clean Air Act Amendments of 1990. In 1992, the Kansas City area showed compliance with the standard and was redesignated to **attainment** and renamed an **ozone** maintenance area. The Kansas City **ozone** maintenance area includes Clay, Jackson and Platte counties in Missouri and Johnson and Wyandotte counties in Kansas.

In 2000, Kansas City reported two **exceedances** of the one-hour **ozone** standard. The Kansas City area did not report any **exceedances** in 1999. The table at left shows the number of days each site reported exceeding the **ozone** standard between 1990 and 2000.

The states of Kansas and Missouri along with the U.S. Environmental Protection Agency (EPA) conducted a monitoring network review during 2000. Missouri has recommended changes to the monitoring network. If the recommendations are accepted the area will add two additional monitors and will relocate several others. The changes to the network should allow for better coverage during diverse meteorological conditions.

CONTROLLING KANSAS CITY OZONE

The Kansas City area has experienced **ozone** problems since the late 1970s. In response to the Clean Air Act Amendments of 1990, the U.S. EPA published two regulations that reduced the Reid vapor pressure (RVP) of gasoline in the Kansas City area. RVP is a measure of the tendency of gasoline to evaporate into the

air. Lowering gasoline's RVP reduces its evaporative emissions. From 1990 through 1997, the RVP of gasoline in Kansas City has been reduced on three occasions. The latest change occurred during summer 1997. The Missouri Department of Natural Resources and Kansas Department of Health and Environment both required that 7.2 RVP gasoline be sold in the Kansas City Maintenance Area during the peak **ozone** season.

The Missouri Department of Natural Resources' Air Pollution Control Program developed an **ozone** control strategy after working with the Mid-America Regional Council (MARC), the Kansas Department of Health and Environment, Kansas City local agencies and industrial representatives. This strategy was to be implemented in place of the contingency measures presented in the 1992 Kansas City **Ozone Maintenance State Implementation Plan**. The Missouri Department of Natural Resources presented this plan to the **Missouri Air Conservation Commission** in April 1997. The commission asked the Department of Natural Resources to remove inspection and maintenance from this plan and replace it with a more expeditious control program. After discussions with MARC and other community representatives, a control strategy including **reformulated gasoline (RFG)** was developed. The revised maintenance plan called for **RFG** to be sold in the Kansas City area starting in 2000. The **Missouri Air Conservation Commission** adopted the Maintenance Plan in February 1998. This plan required the Department of Natural Resources to recommend that the governor ask the U.S. EPA to include the Kansas City area in the federal **RFG** program by April 2000.

RFG would have replaced low RVP gasoline as the fuel control strategy. The Missouri Department of Natural Resources and the Kansas Department of Health and Environment hosted a

Fuels Summit in June 1999. This summit resulted in a recommendation to proceed with **RFG**. The governors of Kansas and Missouri opted into the **RFG** program at the end of July 1999. However, a lawsuit against the U.S. EPA blocked the use of federal **RFG** in former **ozone nonattainment** areas, including Kansas City.

The states of Kansas and Missouri met with petroleum interests that serve the Kansas City market on three occasions during spring 2000. These meetings focused on developing a new fuel strategy for the Kansas City area. The petroleum representatives offered to supply Kansas City with a 7.0 RVP gasoline beginning in 2001. They also said that the states would have to make up any emission reduction shortfalls with stationary source controls.

On June 13, 2000, the Air Quality Forum voted to reaffirm their recommendation that Stage II Vapor Recovery be implemented if a state **RFG**-like fuel was not available to the Kansas City Maintenance Area. On June 29, 2000, the MARC Board of Directors also voted to reaffirm their commitment to implement Stage II Vapor Recovery if a state **RFG**-like fuel was not available for the Kansas City area.

The state of Kansas sent a letter to the U.S. EPA committing to implement a 7.0 RVP gasoline program and a cold solvent cleaning regulation on July 7, 2000. The state of Missouri sent a letter on Aug. 22, 2000, also committing to implement a 7.0 RVP regulation and cold solvent cleaning regulation. In addition, Missouri committed to amending the Stage I Vapor Recovery program in Kansas City to include enhanced reporting and record-keeping, increased inspection frequency and installation of pressure vacuum relief valves. The department is working on these rulemakings and anticipates completion of the revisions to the maintenance plan during late spring or early summer 2001.

Lead In Missouri

Low doses of **lead** can damage the central nervous system of infants and children, causing seizures, disabilities and behavior disorders. In children and adults, **lead** causes fatigue, disturbed sleep and decreased fitness. It damages the kidneys, liver and blood-forming organs. It is suspected of causing high blood pressure and heart disease. High levels damage the nervous system and cause seizures, comas and death. **The National Ambient Air Quality Standards (NAAQS)** are established by the U.S. Environmental Protection Agency (EPA) and limit the amount of certain pollutants allowed in outside air. These limits are based on what is safe for humans to breathe. The **NAAQS** standard for **lead** is set at 1.5 micrograms per cubic meter averaged over a calendar quarter. The federal Clean Air Act Amendments of 1990 require states to bring **nonattainment** areas into compliance with the **lead** standard. **Lead**

emissions are reduced through control strategies and clean work practices. All methods of reducing **lead** emissions are included in the Missouri **State Implementation Plan (SIP)** for **lead**, making them enforceable.

At the beginning of 2000, there were three areas designated as being in **nonattainment** for **lead** standards. The Doe Run Company operates **lead smelters** within these areas. However, on Dec. 18, 2000, the U.S. EPA redesignated the Bixby **lead nonattainment** area to **attainment**.

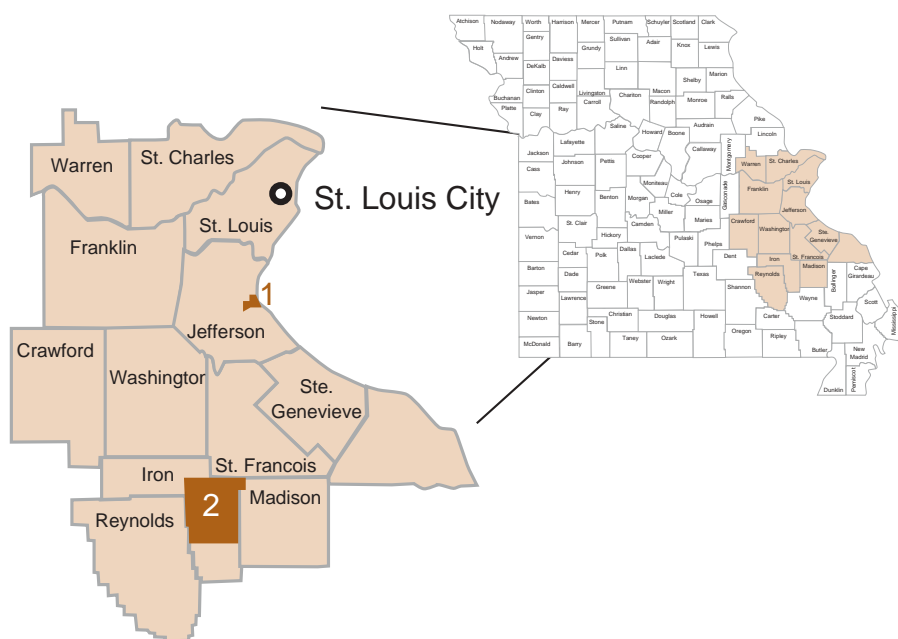
Herculaneum Plan Approval

The Missouri Department of Natural Resources' Air Pollution Control Program recently revised the control strategy for the Herculaneum **lead SIP**. The department's Air Pollution Control Program presented this plan on Oct. 26, 2000. The **Missouri Air Conservation Commission** adopted the plan Dec. 7, 2000.

The **SIP** involved the development of an emission inventory protocol, observation of emission testing, oversight and review of on-site meteorological data, development of a comprehensive hour-by-hour emission inventory, development and considerable refinements of a dispersion model, three rounds of receptor modeling and model reconciliation. The emission control strategy involves enclosure of the main processes at the plant and the installation of building ventilation systems. The ventilation gases will be filtered by high-efficiency filtration systems. Capital costs are expected to be about \$12 million. All controls are expected to be installed by July 31, 2002.

As part of the **SIP** development, the U.S. EPA strongly recommended using a different modeling tool. Chemical Mass Balance modeling is a statistical method of quantifying individual source contributions by exam-

Lead Nonattainment Areas



ining the chemical profile or “finger-print” of each source and comparing this to samples collected in the ambient environment.

Air quality data for the area shows continued violations of the **lead NAAQS**, most notably at the Broad Street monitor. This monitor is located within a few hundred yards of the facility. Preview of the monitoring shows that this monitor gives very high readings on days when the prevailing winds blow directly from the plant to the monitor.

Glover Plan

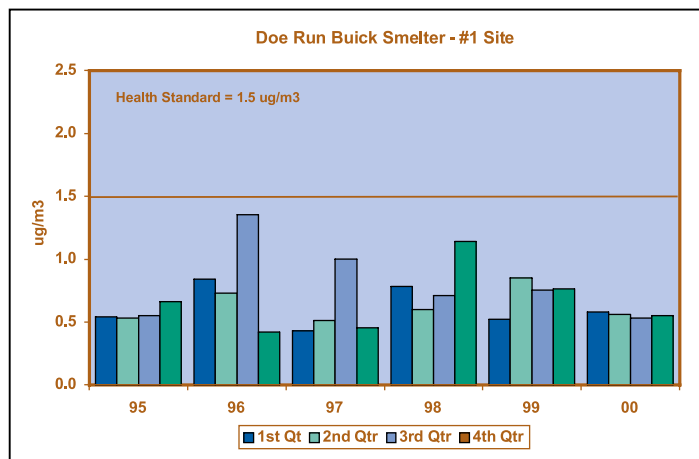
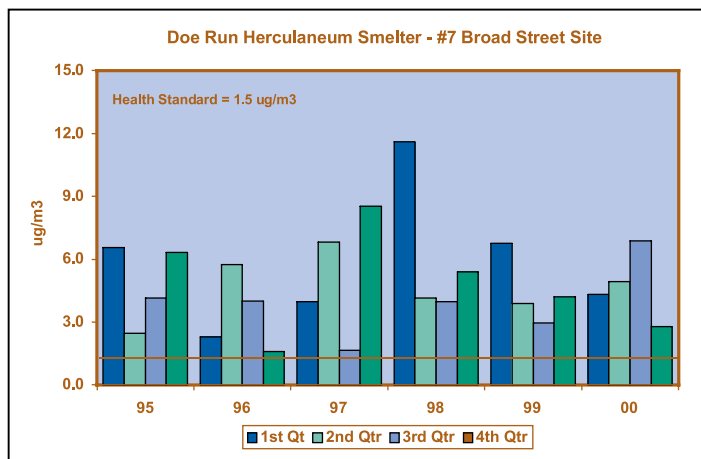
The Doe Run **Smelter** near Glover was formerly known as the ASARCO-Glover **Smelter**. In late August 1998, Doe Run purchased all of ASARCO’s Missouri **lead** interests. In February 1999, the department’s Air Pollution Control Program negotiated an amended consent decree with the Doe Run Company. This comprehensive document specifies

construction schedules, engineering performance criteria, process weight limits, record-keeping requirements, contingency control measures, stipulated penalties and dispute resolution. This action was filed in Iron County Court in August 1999. The new agreement required a formal **SIP** revision. The **Missouri Air Conservation Commission** heard this revision on April 27, 2000, and subsequently adopted it on May 25, 2000. The new consent decree was submitted to the U.S. EPA on July 21, 2000, as an amendment to the **SIP**.

Air monitors near the Doe Run-Glover **Smelter** have not shown a violation of the **NAAQS** since the **SIP** controls were installed Dec. 31, 1996. The department had preliminary meetings with Glover to discuss redesignation of the area to **attainment**. A redesignation request for this area will be developed in 2001.

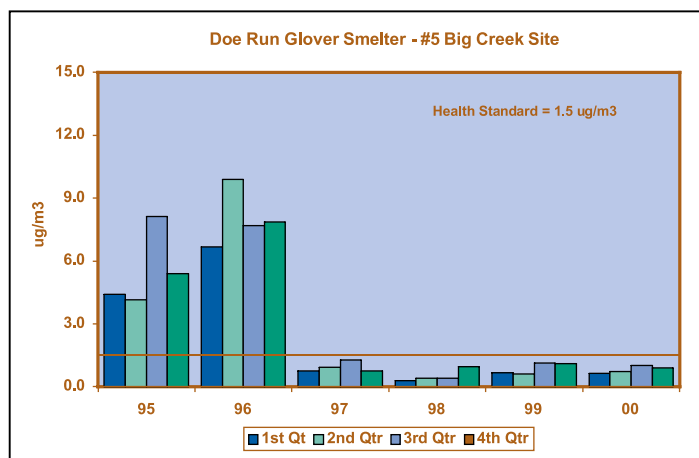
Bixby Redesignation to Attainment

The U.S. EPA announced the redesignation of the **lead nonattainment** area in western Iron County on Dec. 18, 2000. Redesignation means that this area now officially complies with the **NAAQS** for **lead**. The Missouri Department of Natural Resources submitted a plan for maintaining compliance with the **lead** standard to the U.S. EPA May 12, 2000. The maintenance plan outlined steps to ensure permanent and enforceable emission reductions at the Doe Run Resource Recycling Facility near Bixby. The plan submitted by the state also requires operation of a monitoring network and adherence to a manual of best work practices. Finally, the plan includes a commitment by the state to submit a revised maintenance plan eight years after the redesignation date. That revised plan must demonstrate that the area will remain in compliance with the **lead** standard for another 10 years.



Average Quarterly Concentrations of Lead in Ambient Air Near Lead Smelters in Missouri

Since Missouri is the chief **lead**-mining district in the nation, with several **smelters**, the department conducts ambient monitoring for **lead**. Developed by the U.S. EPA, the health standard for **lead** defines the maximum safe level for human exposure to this otherwise useful metal. The **National Ambient Air Quality Standard (NAAQS)** for **lead** is 1.5 micrograms per cubic meter, averaged from all the monitor filters collected in one-quarter of the year. Currently, the Herculaneum **smelter** is the only one registering **exceedances** of the airborne standard.



Fine Particulate Matter

PM_{2.5} is primarily generated from combustion sources. It can be emitted directly as particulate, or it can be formed from gases that are emitted, which combine or condense in the atmosphere to make particles. Sulfur or nitrogen compounds are likely to be significant in different areas of the country. In addition to the ambient monitoring currently being conducted, the department plans in the future to conduct sampling that could be analyzed for specific compounds or species of compounds. This would help determine what types of sources

are most responsible for **PM_{2.5}** levels in different parts of the state.

The time schedule for the **PM_{2.5}** standard to be implemented and attained will take several years because a new monitoring system for this type of pollution must be created. Based on U.S. EPA guidance, Missouri has designed a network of 30 monitors. By the end of 1999, 20 monitoring sites were in operation. The U.S. EPA will designate area **attainment** by 2003 based on three years of gathered data beginning in 2000.

1999 - 2000 PM_{2.5} Data Summary

24-Hr Std = 65 ug/m³, 98th Percentile

Annual Mean Std = 15.0 ug/m³

Site Name	Maximum Values		Annual Mean		Mean 99/00
	1999	2000	1999	2000	
West Alton	43.7	35.2	14.4	14.9	14.6
Margaretta	49.4	41.8	15.3	14.9	15.1
Blair Street	64.5	45.2	17.3	16.3	16.8
South Broadway		42.3		15.8	15.8
Second and Mound	29.0	43.3		15.7	15.7
Florissant Valley	46.9	37.7	14.6	14.3	14.5
Clayton	46.7	51.0	15.2	15.1	15.2
Arnold	46.5	34.8	15.2	14.7	15.0
Liberty	28.9	32.8	11.2	11.0	11.1
North Kansas City	37.3	39.5	12.2	13.1	12.7
Sugar Creek	36.2	37.3	11.8	12.6	12.2
Locust	34.9	41.9	14.0	14.4	14.2
Richards Gebaur-S	30.1	40.9	11.6	11.8	11.7
4928 Main Street		40.4		12.7	12.7
Eldorado Springs	31.2	37.3	11.3	11.5	11.4
Mark Twain State Park	38.9	34.5	11.1	11.0	11.1
Ste. Genevieve	42.1	37.0	13.8	15.2	14.5
SW MO State University	35.0	42.7	12.2	12.3	12.3
Mountain View	50.2	37.2	13.0	13.4	13.2
St. Joseph	30.8	31.9	12.5	11.8	12.2
Carthage Stone	37.7	31.3	13.1	13.2	13.2

units = micrograms per cubic meter

Keeping Country Air Clean

A quick glance at this report might lead readers to believe that air quality is only a metropolitan issue. Air pollution is often associated with smoggy cities filled with smoke-puffing cars and soot-spewing factories. While many of our efforts do focus on keeping air in Kansas City and St. Louis clean and safe, the Department of Natural Resources' Air Pollution Control Program also works diligently with outstate areas of Missouri to maintain pristine air in our rural areas.

Open Burning

Throughout the last century, trash collection and removal services have been difficult to come by in many rural areas. As a result, generations of Missourians have resorted to burning their trash. Now most, if not all, areas of Missouri have access to affordable, convenient methods of trash disposal. However, many Missourians still rely on open burning to dispose of their trash because that's the way generations before them have done it.

Unfortunately, we now know that open burning of household trash can produce levels of certain toxic chemicals higher than a well-controlled municipal waste incinerator burning the trash of tens of thousands of homes, according to a recent study conducted by the U.S. Environmental Protection Agency (EPA).

Lower combustion temperatures and inadequate air supply result in high levels of dangerous emissions being produced. The incomplete burning of household trash can produce

chemicals such as dioxins and furans. Although the effects of these chemicals on humans are still unknown, clinical studies on animals have linked dioxins to cancer, dysfunction and even developmental abnormalities. High levels of dioxin can also cause a skin condition known as chloracne. Common items such as paper and plastic products and some food items may release these chemicals when burned.

Because of these harmful effects, the department regulates many types of open burning. Waste generated by a business, trade, industry or any demolition may not be burned. This includes paper, cardboard boxes, pallets, tires, rubber products, hazardous materials, styrofoam, plastics, petroleum-based products and treated wood. Asbestos-containing materials also cannot be burned. For more information on open burning regulations, contact the department's Air Pollution Control Program at (573) 751-4817, or visit our Web site at www.dnr.state.mo.us/air.htm.

Several alternatives are available. According to Missouri state law, "each city and each county or a combination of cities and counties shall provide individually or collectively for the collection and disposal of solid wastes for those areas within its boundaries that are to be served by the solid waste management system; shall be responsible for implementing their approved plan required by section 260.220 as it relates to the storage, collection, transportation, processing and disposal of their solid wastes."

However, these requirements are relaxed in some rural areas of Missouri. Residents of rural areas may choose to participate in a "Green Box" program. This alternative can provide for a location where local residents can bring their residential waste to a container without being subject to transfer station permitting requirements. Most Missouri residents also have access to commercial trash hauling services or may, for a fee, take their wastes to a permitted transfer station or landfill for proper disposal. Contact your local Solid Waste Management District for more information or contact the Department of Natural Resources' Solid Waste Management Program at (573) 751-5401 for more information on alternatives to open burning.

Concentrated Animal Feeding Operations

Over the last few decades the number of Missouri farms has decreased. However, as the number of farms has decreased, the sizes of these farms have increased. Fewer farms and greater farm size means that production is becoming more concentrated.

Looking at just a few Missouri counties shows how quickly things can change. Nationally, Sullivan County was ranked 736 in terms of hog and pork production in 1992. By 1997, it jumped to 6th largest hog and pork producer in the United States (from 15,000 hogs and pigs in 1992 to more than 529,000 hogs and pigs in 1997). Mercer County leapt from 114 to 13 on this list. Vernon County went from 201 to 89 and Gentry County from 416 to 98.



Changes of this magnitude place tremendous strains on the environment. Individual farms can become quite large. Many people begin to perceive these operations as factories, rather than farms, and these factories may evoke negative images.

Until recently this change in Missouri agriculture occurred without any air regulations. Farming has traditionally been exempt from air regulations to allow farmers the right to farm their own land. This right is especially important as urban areas encroach upon rural areas and people are exposed to new sights, sounds and odors. However, in the last decade this situation has reversed and large farms are suddenly appearing and encroaching upon already rural areas. These large farms concentrate the number of animals and the odors associated with these animals and their waste.

In the past, odor control has depended on individual management practices. Odor control practices that work for a few animals don't always work for 1,000, 10,000 or 1000,000 animals.

The Department of Natural Resources' Air Pollution Control Program recently began working to control odor emissions from large Concentrated Animal Feeding Operations (CAFOs). Missouri's largest CAFOs are defined as Class IA and have animal populations starting at 4,900 head of dairy cows; 17,500 head of finishing hogs; or 210,000 laying

hens. Missouri has 20 Class IA CAFOs. Many of these operations are considerably larger than the minimum necessary to qualify as a Class IA CAFO.

The department's Air Pollution Control Program amended its regulations in 1999 to remove the odor exemption for Class IA CAFOs because odors generate a number of complaints. More than 100 odorous compounds have been identified as coming from large hog CAFOs. The department's odor regulation now requires all existing and new Class IA CAFOs to submit an odor control plan to the department. This plan outlines how the operation will manage odor.

Existing CAFOs will have to implement their plans by Jan. 1, 2002. New CAFOs must have approved odor plans prior to operation. In addition, the department's odor regulation establishes an odor performance standard beginning Jan. 1, 2002. This performance standard is measured at the operations' boundaries. Operations exceeding that standard are in violation of the regulation and subject to fines and corrective measures.

Odors from CAFOs can come from several areas, but they primarily result from animal housing and waste disposal. Waste storage and disposal are often cited as among the worst odor generators. Open storage of waste in lagoons and aerial spraying of waste on fields are visible signs of the amount of waste generated.

Building odors can also be strong depending upon how the waste is managed in the building.

Well-planned building and waste storage designs, management practices and controls can be implemented on CAFOs to reduce odor. The problem the department now faces is determining how to address odors at existing CAFOs that were not designed with odor control in mind.

Odor emissions are difficult to control. Targeting one or two compounds may not be sufficient to change the perceived odor and controlling all the compounds may be impossible. Odor control at these operations requires a broader approach.

Rather than mandating specific controls to be implemented at all facilities, the department's Air Pollution Control Program regulations require each Class IA CAFO owner to evaluate odor control options and implement those that make sense for his or her operation. This regulatory approach is designed to accommodate the differences in animal types and operations.

Compliance with the odor performance standard begins Jan. 1, 2002. Class IA CAFOs have been submitting their odor control plans to the department's Air Pollution Control Program and technical reviews are under way. Approved odor control plans should be implemented in 2001.



Air Pollution Information on the Internet

There is a wealth of information about air quality issues on the Internet. You may find some of the following World Wide Web addresses helpful:

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Air Pollution Control Program (www.dnr.state.mo.us/deq/apcp)

General Department Information (www.dnr.state.mo.us)

Technical Assistance Program (www.dnr.state.mo.us/deq/tap)

The complete Missouri Air Law
(www.moga.state.mo.us/statutes/c643.htm)

Department of Natural Resources - Air Quality Monitoring
(www.dnr.state.mo.us/deq/esp)

Code of State Regulations (mosl.sos.state.mo.us/csr/csr.htm)

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA Region VII (Kansas City) (www.epa.gov/region07/)

Office of Air and Radiation (www.epa.gov/oar/)

Air Links - EPA Air Quality Publications (www.epa.gov/airlinks/)

OTHER AIR QUALITY ORGANIZATIONS:

St. Louis Regional Clean Air Partnership (www.cleanair-stlouis.com/)

Heartland Sky (Kansas City)
(www.marc.org/environment/heartsky.htm)

American Lung Association (www.lungusa.org/)

Air and Waste Management Association (www.awma.org/)

Missouri Department of Health (www.health.state.mo.us/)

DAILY AIR QUALITY FORECASTS:

Kansas City (www.marc.org/airquality/airqual.htm#skycast)

St. Louis (www.cleanair-stlouis.com/4cast.htm)

About The Air Pollution Control Program

The mission of the Department of Natural Resources' Air Pollution Control Program is "to maintain purity of the air resources of the state to protect the health, general welfare and physical property of the people, maximum employment and the full industrial development of the state." The program serves the public with technology, planning, enforcement, permitting, financial and information services to achieve this mission.

Technical Support

The program's staff looks at the quality of the air in Missouri using chemistry, meteorology, mathematics and computer modeling. Staff members research the sources and effects of air pollution, collecting and maintaining an annual inventory of sources that give off air pollution. In conjunction with the Department of Natural Resources' Environmental Services Program and four local agencies, the Air Pollution Control Program staff designs and coordinates an air-monitoring network and examines monitoring data. The network provides air quality data from more than 40 locations around the state. Using the monitoring data and other data on source emissions and the weather, the staff runs computer models of the atmosphere to predict air quality.

Planning

The program's staff develops rules and plans designed to protect and improve Missouri's air quality. Public participation is a vital part of the cooperative process of developing

guidelines and regulations. The staff works with businesses, federal, state and local government agencies, environmental groups and the public to exchange ideas and information on clean air issues with advisory groups, workgroups and workshops.

The staff works closely with EPA as part of the national effort to improve air quality through the Clean Air Act. The staff research and study complex environmental issues to develop air pollution control strategies that will allow Missouri's progress toward achieving and maintaining healthy air quality improvements. These air pollution control strategies are included in the **state implementation plan (SIP)** to control specific pollutants. The **Missouri Air Conservation Commission** (*see p. 31*) approves the **state implementation plan** and rule actions after they have gone through a public hearing process. When the **Missouri Air Conservation Commission** adopts rules, they become effective through publication in the *Missouri State Code of Regulations*. The **state implementation plan** and associated rules adopted by the **Missouri Air Conservation Commission** are submitted to EPA for inclusion in the federally approved state plan.

Permits

The program's staff reviews construction permit applications of new or modified emission sources to make sure that facilities minimize the release of air contaminants and will meet the requirements of the state and federal law and regulations.

Operating permit applications, similar to business licenses, are also received and issued. Operating permits staff identifies all the air pollution control requirements of a source of air pollution.

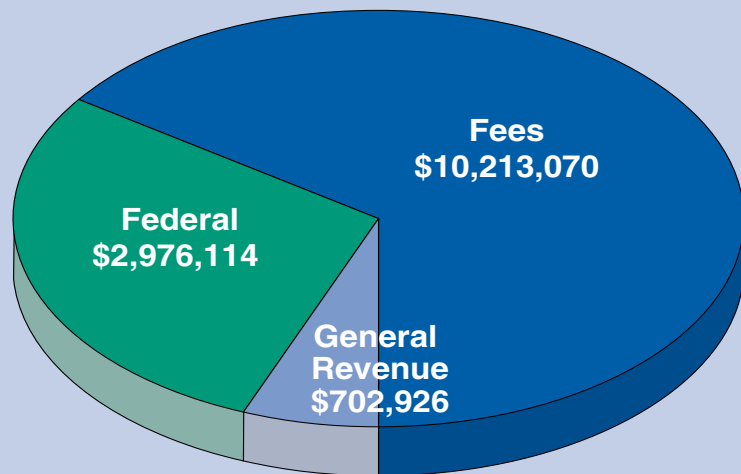
Enforcement

The program, through the department's regional offices, responds to complaints about air quality and help businesses comply with various federal, state and local rules. Staff conducts routine site inspections and oversees the testing of smokestacks, asbestos removal, gasoline vapor recovery equipment and other sources of air pollution. When a source violates an air quality requirement, the staff works with the facility to correct the problem and may take additional action, including the assessment of penalties necessary to obtain compliance with the requirement. Cases that cannot be resolved are referred to the Missouri Attorney General's office through the **Missouri Air Conservation Commission**.

Administration

The program's staff provides budgeting, procurement, public information and personnel services. The staff also provides liaisons for the **Missouri Air Conservation Commission**, EPA, the Missouri Department of Health, local air agencies in Kansas City, St. Louis, St. Louis County and Springfield, the American Lung Association and the news media.

2002 Revenue by Source



Total: \$13,892,110

2002 Revenue by Source

The Air Pollution Control Program receives funds from three sources: general tax revenue approved by the Missouri General Assembly, federal funds from EPA and four types of fees collected by the program. Since 1972, the program collected fees from businesses seeking permits to build new or modify existing emission sources. Since 1984, the state collected a fee to test the emissions of 1.2 million motor vehicles in the city of St. Louis and in Franklin, Jefferson, St. Charles and St. Louis counties. In 2000, an enhanced inspection program was initiated in all of these counties except Franklin, which still uses the basic test. Since 1993, the program collected an emission fee from air pollution sources under the Missouri Air Conservation Law. Since 1989, the program collected fees to

ensure the safe removal of asbestos; a cancer-causing substance of combined materials once used to insulate buildings. Funds received by the program are shown in the table above.

Local Agencies

A city or county may have its own air agency under two conditions: the city must be able to enforce its rules and its rules must be as strict as the state's. Local agencies issue permits, maintain their own monitoring networks and may enforce asbestos-removal laws. The local agencies are partially funded by EPA through the Department of Natural Resources. Four local governments in Missouri practice regional control over air pollution: Kansas City, St. Louis, St. Louis County and Springfield.

Missouri Air Conservation Commission

Created by the Missouri General Assembly in 1965, the **Missouri Air Conservation Commission** has seven members appointed by the governor. The commission carries out the Missouri Air Conservation Law (Chapter 643, Revised Statutes of Missouri). The primary duty of the commission is to achieve and maintain the **National Ambient Air Quality Standards** established by the U.S. EPA. When the quality of the air meets these standards, an area is said to be in **attainment**. If monitors detect too much of one pollutant, however, the area is a **nonattainment** area for that pollutant.

Members serve four-year terms, and the commission meets at least nine times per year. All meetings are open to the public and comments are welcome. Most meetings include public hearings where rule actions, **state implementation plans** and other matters are heard.

At meetings, the commission adopts, amends and rescinds rules; hears appeals of enforcement orders and permit conditions; initiates legal action to enforce rules; assigns duties to local air pollution control agencies; classifies regions as **attainment** or **nonattainment areas** and approves plans to meet national standards in **nonattainment areas**.

Notices of public hearings are published in the public-notice sections of these newspapers: *Columbia Daily Tribune*, *The Kansas City Star*, *Kirksville Daily Express*, *Poplar Bluff Daily American Republic*, *Springfield News-Leader*, *St. Joseph News Press* and the *St. Louis Post-Dispatch*. They are also published in the *Missouri Register*. To be placed on a mailing list to receive notice of public hearings and meetings, you may contact the Department of Natural Resources' Air Pollution Control Program at (573) 751-4817.

Information on public hearings and **Missouri Air Conservation Commission** meetings is also available on our home page at (www.dnr.state.mo.us/dnr/apcp).



Bob Holden
Governor
State of Missouri

2000 Missouri Air Conservation Commission

David Zimmerman
Chair

Michael Foresman
Vice-chair

Harriet Beard
Frank Beller
Joanne Collins
Andy Farmer
Barry Kayes

Steve Mahfood
Director
Department of
Natural Resources

John Young
Director
Department of Natural
Resources' Division of
Environmental Quality

Roger D. Randolph
Director
Department of Natural
Resources' Air Pollution
Control Program

MACC members, left to right: Frank Beller, Harriet Beard, Andy Farmer, Joanne Collins, David Zimmermann, and Barry Kayes. Not pictured: Michael Foresman.

Down the Road

Regional Haze: The U.S. EPA recently finalized a rule to improve visibility in the Class I Wilderness Areas of the United States. The pollutants that obscure visibility are called “haze.” Missouri has two Class I areas: Hercules Glade Wilderness Area in Taney County and Mingo Wilderness Area in Stoddard and Wayne counties. Some pollutants that contribute to haze, mostly fine particles, are directly released into the atmosphere by a variety of activities including electric power generation, industry, mobile sources, agricultural burning and forestry burning. Sulfates and nitrates, both products of fossil fuel combustion, contribute to haze. In Missouri, sulfates are likely to be a dominant source of visibility impairment. Improvements in visibility are expected to occur over many decades with the goal of reducing haze in the Class I areas to natural background conditions in 60 years. The photographs on this page reflect the air quality differences at Hercules Glade on good and poor air quality days.

Eight-Hour Ozone Standard:

Due to court rulings, a new standard adopted in 1997 to reduce ground-level **ozone** stalled in 1999. However, the U.S. Supreme Court agreed to hear an appeal of the case in 2000. A decision is expected in spring 2001. The new **ozone** standard, known as the eight-hour standard, would reduce allowable **ozone** concentrations from 0.12 parts per million averaged over a one-hour period to a standard of 0.08 parts per million averaged over an eight-hour period.

Photographs provided by David A. Castillon, Ph.D., Geomorphologist.

2000 Rules Update

In 2000, the **Missouri Air Conservation Commission** adopted 25 rule actions. A list of rules is available at mosl.sos.state.mo.us/csr/csr.htm. The following list highlights a few of the most significant rules adopted:

10 CSR 10-6.020 Definitions and Common Reference Tables

This rule amendment adopted regulatory language improvements developed through the efforts of the construction permit workgroup that streamlined the permitting process. As a result of this amendment, the rule now provides the definition for criteria pollutant and contains regulatory language for determining creditability of emission increases and decreases. The definition for the St. Louis **carbon monoxide nonattainment area** was also deleted since the area was redesignated to **attainment** for **carbon monoxide**.

10 CSR 10-5.380 Motor Vehicle Emissions Inspection

This rule action amended the rule to incorporate state legislation, Senate Bill 19, that was signed into law in July 1999. The amendment removed a penalty for the contractor that applied when motorists wait an excessive amount of time for an emissions test, incorporated a transitional program leading up to the permanent enhanced inspection and maintenance program and provided inspection program options for Franklin County residents.

10 CSR 10-6.350 Emissions Limitations and Emissions Trading of Oxides of Nitrogen

This new rule reduces transported emissions of **oxides of nitrogen (NO_x)** which negatively affect the St. Louis **ozone nonattainment area**. The rule incorporates an emissions trading program to reduce emissions of **NO_x** from electrical generating units within the state of Missouri. This rule action was a required part of the department's **attainment** date extension request for the St. Louis **ozone nonattainment area**.

10 CSR 10-6.070 New Source Performance Regulations, 10 CSR 10-6.075 Maximum Achievable Control Technology Regulations and 10 CSR 10-6.080 Emission Standards for Hazardous Air Pollutants

These rule amendments incorporate updates to federal regulations that are referenced in these rules. The state is required to adopt these updates and enforce them as part of the state's operating permits program.

10 CSR 10-2.205 Control of Emissions from Aerospace Manufacture and Rework Facilities

This new rule reduces volatile organic compound (VOC) emissions from aerospace manufacture and rework facilities located in the Kansas City **ozone** maintenance area. It contains a list of VOC coatings operations used in the aerospace manufacture and rework industry and VOC content limits and record-keeping requirements for these operations. The rulemaking is required for compliance with the Clean Air Act Amendments of 1990 and was identified in the Kansas City **Ozone** Maintenance Plan as adopted on Feb. 3, 1998.

10 CSR 10-5.375 Motor Vehicle Emission Inspection Waiver

The amendment to this rule modifies the Franklin County emission inspection waiver procedure by removing the waiver time constraint and replacing references to Missouri State Highway Patrol licensed inspectors and mechanics with references to Qualified Repair Technicians.

10 CSR 10-6.120 Restriction of Emissions of Lead From Specific Lead Smelter-Refinery Installations

This rule amendment incorporated a new emission limit for the main stack and two baghouse stacks at the Doe Run primary **lead smelter** located in Herculaneum, Missouri. This amendment was incorporated to help the area attain the **National Ambient Air Quality Standard** for **lead**. At the same time, the name of the **smelter** located in Glover was changed to reflect a change in ownership.



State Implementation Plan/Air Quality Plans

The department's Air Pollution Control Program submits rules to the **Missouri Air Conservation Commission** and writes the **State Implementation Plan (SIP)** and air quality plans that indicate how Missouri will achieve and maintain the federal standards for pollutants.

The **SIP** is the primary method for achieving the **National Ambient Air Quality Standards** for compliance with the Clean Air Act. Distinct air quality plans are developed for specific air pollutants. Whenever concentrations of one of these pollutants exceed federal standards, a plan is developed to bring the pollutant into compliance. Plan development includes a new inventory of emission levels, computer modeling of emissions' sources and the effects of emission sources, control strategies and regulatory requirements or rules.

Another type of air quality plan, called a State Plan, also involves an emission inventory, controls and rules, but addresses emission source types as well as specific pollutants.

The **Missouri Air Conservation Commission** adopted the following five plan actions in 2000:

Control of Lead Emissions Plan for Doe Run – Bixby, Mo.* (Western Iron County Lead Nonattainment Area)

This plan revision provided background, data and justification for redesignating the **lead nonattainment area** in western Iron County to **attainment** for **lead**. The revision included the new plan to control **lead** emissions from the Doe Run Resource Recycling Facility near Bixby.

Missouri State Implementation Plan Revision (St. Louis Local Code Update and Administrative Rule Removal)

This revision to the Missouri **SIP** replaced the St. Louis City ordinance

open burning and incinerator requirements that were in the **SIP** with more recently updated requirements. In addition, this revision removed rule 10 CSR 10-1.010 General Organization from the **SIP** because the requirements in that rule are administrative.

Control of Lead Emissions Plan for Doe Run – Glover, Mo.* (eastern Iron County Lead Nonattainment Area)

This plan revision incorporated a modified consent decree that recognizes the Doe Run Resource Corporation as the owner and operator of the **lead** smelting facility located near Glover as of Aug. 30, 1998. Doe Run had been operating the **smelter** since that date, and in the modified consent decree Doe Run accepts the conditions of an original consent decree with four minor additions.

Attainment Demonstration Plan* (St. Louis Ozone Nonattainment Area)

This plan action revised the **attainment** demonstration modeling and analyses to incorporate corrections to the 1996 base-year emissions inventory. This revision was required by the U.S. Environmental Protection Agency in order to demonstrate that the St. Louis area attains the one-hour **ozone** standard.

Control of Lead Emissions Plan for Doe Run – Herculaneum, Mo.* (Herculaneum, Mo. Lead Nonattainment Area)

This plan action amended the plan to control **lead** emissions at the Doe Run Herculaneum facility. It includes a comprehensive emission inventory, technical modeling analysis that demonstrates **attainment**, and a consent decree and work practice manual that makes the emission control projects enforceable. This plan action is required by the federal Clean Air Act Amendments of 1990.

*These plans are part of the Missouri **State Implementation Plan**

2000 Rules Update

In 2000, the **Missouri Air Conservation Commission** adopted 25 rule actions. A list of rules is available at mosl.sos.state.mo.us/csr/csr.htm. The following list highlights a few of the most significant rules adopted:

10 CSR 10-6.020 Definitions and Common Reference Tables

This rule amendment adopted regulatory language improvements developed through the efforts of the construction permit workgroup that streamlined the permitting process. As a result of this amendment, the rule now provides the definition for criteria pollutant and contains regulatory language for determining creditability of emission increases and decreases. The definition for the St. Louis **carbon monoxide nonattainment area** was also deleted since the area was redesignated to **attainment** for **carbon monoxide**.

10 CSR 10-5.380 Motor Vehicle Emissions Inspection

This rule action amended the rule to incorporate state legislation, Senate Bill 19, that was signed into law in July 1999. The amendment removed a penalty for the contractor that applied when motorists wait an excessive amount of time for an emissions test, incorporated a transitional program leading up to the permanent enhanced inspection and maintenance program and provided inspection program options for Franklin County residents.

10 CSR 10-6.350 Emissions Limitations and Emissions Trading of Oxides of Nitrogen

This new rule reduces transported emissions of **oxides of nitrogen (NO_x)** which negatively affect the St. Louis **ozone nonattainment area**. The rule incorporates an emissions trading program to reduce emissions of **NO_x** from electrical generating units within the state of Missouri. This rule action was a required part of the department's **attainment** date extension request for the St. Louis **ozone nonattainment area**.

10 CSR 10-6.070 New Source Performance Regulations, 10 CSR 10-6.075 Maximum Achievable Control Technology Regulations and 10 CSR 10-6.080 Emission Standards for Hazardous Air Pollutants

These rule amendments incorporate updates to federal regulations that are referenced in these rules. The state is required to adopt these updates and enforce them as part of the state's operating permits program.

10 CSR 10-2.205 Control of Emissions from Aerospace Manufacture and Rework Facilities

This new rule reduces volatile organic compound (VOC) emissions from aerospace manufacture and rework facilities located in the Kansas City **ozone** maintenance area. It contains a list of VOC coatings operations used in the aerospace manufacture and rework industry and VOC content limits and record-keeping requirements for these operations. The rulemaking is required for compliance with the Clean Air Act Amendments of 1990 and was identified in the Kansas City **Ozone** Maintenance Plan as adopted on Feb. 3, 1998.

10 CSR 10-5.375 Motor Vehicle Emission Inspection Waiver

The amendment to this rule modifies the Franklin County emission inspection waiver procedure by removing the waiver time constraint and replacing references to Missouri State Highway Patrol licensed inspectors and mechanics with references to Qualified Repair Technicians.

10 CSR 10-6.120 Restriction of Emissions of Lead From Specific Lead Smelter-Refinery Installations

This rule amendment incorporated a new emission limit for the main stack and two baghouse stacks at the Doe Run primary **lead smelter** located in Herculaneum, Missouri. This amendment was incorporated to help the area attain the **National Ambient Air Quality Standard** for **lead**. At the same time, the name of the **smelter** located in Glover was changed to reflect a change in ownership.



State Implementation Plan/Air Quality Plans

The department's Air Pollution Control Program submits rules to the **Missouri Air Conservation Commission** and writes the **State Implementation Plan (SIP)** and air quality plans that indicate how Missouri will achieve and maintain the federal standards for pollutants.

The **SIP** is the primary method for achieving the **National Ambient Air Quality Standards** for compliance with the Clean Air Act. Distinct air quality plans are developed for specific air pollutants. Whenever concentrations of one of these pollutants exceed federal standards, a plan is developed to bring the pollutant into compliance. Plan development includes a new inventory of emission levels, computer modeling of emissions' sources and the effects of emission sources, control strategies and regulatory requirements or rules.

Another type of air quality plan, called a State Plan, also involves an emission inventory, controls and rules, but addresses emission source types as well as specific pollutants.

The **Missouri Air Conservation Commission** adopted the following five plan actions in 2000:

Control of Lead Emissions Plan for Doe Run – Bixby, Mo.* (Western Iron County Lead Nonattainment Area)

This plan revision provided background, data and justification for redesignating the **lead nonattainment area** in western Iron County to **attainment** for **lead**. The revision included the new plan to control **lead** emissions from the Doe Run Resource Recycling Facility near Bixby.

Missouri State Implementation Plan Revision (St. Louis Local Code Update and Administrative Rule Removal)

This revision to the Missouri **SIP** replaced the St. Louis City ordinance

open burning and incinerator requirements that were in the **SIP** with more recently updated requirements. In addition, this revision removed rule 10 CSR 10-1.010 General Organization from the **SIP** because the requirements in that rule are administrative.

Control of Lead Emissions Plan for Doe Run – Glover, Mo.* (eastern Iron County Lead Nonattainment Area)

This plan revision incorporated a modified consent decree that recognizes the Doe Run Resource Corporation as the owner and operator of the **lead** smelting facility located near Glover as of Aug. 30, 1998. Doe Run had been operating the **smelter** since that date, and in the modified consent decree Doe Run accepts the conditions of an original consent decree with four minor additions.

Attainment Demonstration Plan* (St. Louis Ozone Nonattainment Area)

This plan action revised the **attainment** demonstration modeling and analyses to incorporate corrections to the 1996 base-year emissions inventory. This revision was required by the U.S. Environmental Protection Agency in order to demonstrate that the St. Louis area attains the one-hour **ozone** standard.

Control of Lead Emissions Plan for Doe Run – Herculaneum, Mo.* (Herculaneum, Mo. Lead Nonattainment Area)

This plan action amended the plan to control **lead** emissions at the Doe Run Herculaneum facility. It includes a comprehensive emission inventory, technical modeling analysis that demonstrates **attainment**, and a consent decree and work practice manual that makes the emission control projects enforceable. This plan action is required by the federal Clean Air Act Amendments of 1990.

*These plans are part of the Missouri **State Implementation Plan**

Air Quality Information

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Air Pollution Control Program(573) 751-4817

P.O. Box 176 Jefferson City, MO 65102-0176

Environmental Services Program(573) 526-3315

Technical Assistance Program1-800-361-4827

General Department of Natural Resources' Information1-800-334-6946

Relay Missouri (for use by the hearing impaired)1-800-735-2966

Jefferson City Regional Office(573) 751-2729

Kansas City Regional Office(816) 622-7000

Northeast Regional Office (Macon)(660) 385-2129

St. Louis Regional Office(314) 301-7100

Southeast Regional Office (Poplar Bluff)(573) 840-9750

Southwest Regional Office (Springfield)(417) 891-4300

IN CASE OF AN ENVIRONMENTAL EMERGENCY:

Missouri Department of Natural Resources

Emergencies only 24 hours a day(573) 634-2436

Emergency Response Office weekdays(573) 526-3315

U.S. Environmental Protection Agency - Region VII(913) 551-7020

National Response Center (A service of the U.S. government for reporting oil and chemical spills)1-800-424-8802

CHEMTREC (A service of the chemical industry for reporting chemical spills, leaks and fires)1-800-424-9300

OTHER AIR QUALITY ORGANIZATIONS:

Missouri Department of Health(573) 751-6400

St. Louis Regional Clean Air Partnership(314) 645-5505

Heartland Sky (Kansas City)(816)-474-4240

American Lung Association of Eastern Missouri(314) 645-5505

American Lung Association of Western Missouri(816) 842-5242

Kansas City Health Department(816) 513-6314

City of St. Louis - Division of Air Pollution Control(314) 613-7300

St. Louis County - Department of Health(314) 615-8923

Springfield-Greene County - Air Pollution Control Authority(417) 864-1662

GLOSSARY

Attainment: The designation given to an area that meets all National Ambient Air Quality Standards.

Carbon monoxide (CO): A poisonous gas that is odorless, colorless and tasteless. At low levels it causes impaired vision and manual dexterity, weakness and mental dullness. At high levels it may cause vomiting, fast pulse and breathing followed by a slow pulse and breathing, then collapse and unconsciousness.

Exceedance: An exceedance occurs when levels of a certain pollutant are higher than those deemed safe by the federal government.

Inhalable particles (PM₁₀ and PM_{2.5}): A broad class of particles sometimes simply referred to as “soot.” One of the “criteria pollutants,” PM₁₀ particles are 10 microns or smaller in diameter. The pollutant increases the likelihood of chronic or acute respiratory illness. It also causes difficulty in breathing, aggravation of existing respiratory or cardiovascular illness and lung damage. In addition it causes decreased ability to defend against foreign materials. New laws have just been passed regulating PM_{2.5}, an even smaller and more harmful class of fine particles less than 2.5 microns in diameter. Missouri is beginning to monitor its concentrations.

Lead (Pb): Airborne lead appears as dust-like particles ranging from light gray to black. Low doses may damage the central nervous system of fetuses and children, causing seizures, mental retardation and behavioral disorders. In children and adults, lead causes fatigue, disturbed sleep and decreased fitness, and it damages the kidneys, liver and blood-forming organs. It is suspected of causing high blood pressure and heart disease. High levels damage the nervous system and cause seizures, comas and death.

Missouri Air Conservation Commission: The governor appoints this seven-member group. The commission carries out the Missouri Air Conservation Law (Chapter 643, Revised Statutes of Missouri). The primary duty of the commission is to help Missouri achieve the National Ambient Air Quality Standards set by the U.S. Environmental Protection Agency.

National Ambient Air Quality Standards (NAAQS): Standards set by the U.S. Environmental Protection Agency that limit the amount of six air pollutants allowed in outside air. These six are carbon monoxide, inhalable particles, lead, nitrogen dioxide, ozone and sulfur dioxide. The limits are based on what is safe for humans to breathe.

Nitrogen dioxide (NO₂): A poisonous, reddish-brown to dark brown gas with an irritating odor. It can cause lung inflammation and can lower resistance to infections like bronchitis and pneumonia. It is suspected of causing acute respiratory disease in children.

Nonattainment area: A region in which air monitors detect more of a pollutant than is allowed by the National Ambient Air Quality Standards set by the U.S. Environmental Protection Agency. The U.S. Environmental Protection Agency may designate a region as a “nonattainment area” for that pollutant.

Ozone (O₃): Three atoms of oxygen; a colorless gas with a pleasant odor at low concentrations. The layer of ozone in the atmosphere protects the earth from the sun’s harmful rays. Ground-level ozone is a summertime hazard produced when hydrocarbons from car exhaust and other fumes mix in the presence of sunlight with oxides of nitrogen from power plants and other sources. Ozone is more easily recognized in smog, a transparent summer haze that hangs over urban areas. The result is a gas that aggravates respiratory illness, makes breathing difficult and damages breathing tissues. Victims include people with lung disease, the elderly, children and adults who exercise outside.

Ozone Violation: Four or more exceedances of the federal ozone standard occurring in a three-year period at the same monitoring site.

Reformulated Gasoline (RFG): A fuel blend designed to reduce air toxins and volatile organic compound (VOC) emissions by decreasing the amount of toxic compounds such as benzene, lowering the evaporation rate and increasing the amount of oxygenate blended with the fuel.

Smelter: A facility that uses chemical and physical processes to turn metallic ores (such as lead sulfide concentrates) into sellable pure metal and alloy products.

State Implementation Plan (SIP): A plan submitted by the Missouri Department of Natural Resources to the Environmental Protection Agency for complying with national air quality standards. Each plan concerns one air pollutant for one nonattainment area.

Sulfur Dioxide (SO₂): A colorless gas with a strong, suffocating odor. Causes irritation of the throat and lungs and difficulty in breathing. It also causes aggravation of existing respiratory or cardiovascular illness.